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Thermophysical Properties of High Temperature Solid Materials

VOLUME THE NONFERROUS ALLOYS

Thermophysical Properties

Research Center, Purdue University

Y. S. TOU! OUKIAN, Editor

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VOLUME 2: NONFERROUS ALLO 'S

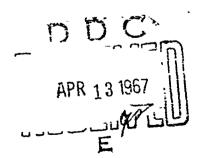
Part II: Nonferrous Multiple Alloys

Thermophysical Properties Research Center

Y. S. Touloukian, EDITOR

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Air Force Materials Laboratory
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Wright-Patterson Air Force Base, Ohio



THE MACMILLAN COMPANY, NEW YORK COLLIER-MACMILLAN LIMITED, LONDON

PREFACE

The phenomenal growth of science and technology since the early forties has brought about a universal appreciation of the fact that present limitations in many technical developments are often a direct result of the paucity of knowledge on the properties of materials. Engineering developments in the years ahead will be closely linked to the research that is done today to contribute to a better understanding of the properties of matter, of which thermophysical properties constitute a major segment.

With a realization of the seriousness of this situation, a great deal of research effort has been made in recent years on the thermophysical properties of materials with the result that the volume of research literature has increased many fold. In spite of this fact, it is generally agreed that the present level of research on thermophysical properties still falls substantially short of existing needs and anticipated future demands. However, what is even more disturbing is the fact that engineering groups across the nation are using no more than a fraction of the information already available, either because it is in a form not directly useful to them or, often, because its existence is not generally known.

To partially remedy this situation concerning the thermophysical properties of high temperature materials, the Materials Laboratory of the U.S. Air Force at Wright-Patterson Air Force Base sponsored a project in 1957 to bring together a large portion of the then available data in a single work for easy reference. From this compilation, performed by the Armour Research Foundation, a four-volume work entitled Hardbook of Thermophysical Properties of Solid Materials emerged. It was first published in 1960 as WADC TR58-476; in 1961 it was issued as a hard-bound set by The Macmillan Company.

Because of the favorable reception given to this original work, the Materials Laboratory of the U.S. Air Force requested the Thermophysical Properties Research Center (TPRC), in 1964, to update and revise this reference work in order to increase its usefulness and to put it on a more current basis. The present six-volume work, entitled Thermophysical Properties of High Temperature Solid Materials, consists of nine books totaling more than \$,500 pages. It is the result of a two-year project by TPRC. This new encyclopedic reference work cannot be called a revised edition of the earlier publication since nearly every page has been changed through major additions, corrections, and re-evaluation. An effort was made to adhere to the basic format of the earlier work. However, the organization of the material and the index to materials have been completely redesigned for greater ease in locating the information desired.

Inevitably, not all of the properties covered have received the same degree of attention. The material on thermal radiative properties, thermal diffusivity, and specific heat has been totally revised and rewritten. Materials on the coefficient of thermal expansion and thermal conductivity have received rajor revisions, and those on electrical resistivity, density, and melting point have had moderate revisions. Finally, lesser revisions were made to data concerning vapor pressure and heats of transformation. The new information incorporated into the work covered research conducted primarily during the years 1957 to 1964, although some major references are included from 1965 and some from as far back as 1910.

In processing the large amount of new and old data incorporated in these volumes, it was necessary that some degree of selectivity be exercised both from the standpoint of the references cited and the data extracted from them. It is hoped, however, that no major source of information has been omitted. Whenever possible, an effort was made to suggest recommended values of the properties. In the plots, recommended values are indicated by curves. It should be clear, however, that the designation of "recommended values" in no way implies that a critical analysis has been performed in all cases, nor does it suggest that they repre-

sent definitive values. Because most of the materials covered are not well-defined engineering materials, and because there is often a great paucity of information, any critical evaluation of these data is most diffscult—if not impossible.

With a full appreciation of these inherent difficulties it is nevertheless hoped that the present compendix will prove to be of great usefulness to engineers seeking information on thermophysical properties. In spite of the extreme care exercised in processing the data and proofing the manuscript, it is possible that some errors might have been inadvertently overlooked. Should any instance of such oversight be uncovered, the Editor would be most indebted if it is brought to his attention.

The fact that such an enormous undertaking could be accomplished in such a short time is attributable primarily to '17RC's unique resources in the area of thermophysical properties information. Grateful acknowledgment is made to the Electronic Properties Information Center for assistance in providing bibliographic searches on electrical resistivity and to the Air Force Materials Laboratory for general assistance in bibliographic information. Extensive personal inquiries were made to the authors of research papers and reports requesting clarification and original data. The enthusiastic response to these inquiries (in the majority of the cases) is also gratefully acknowledged. The Editor and ' . contributing staff wish to give a special note of thanks in acknowledging the valuable assistance and cooperation they received individually and collectively from TPRC's Scientific Documentation Division personnel and the supporting staff of graphics and technical typists without whose painstaking and skillful contributions this work would not have been possible.

This work was performed under Contract No. AF33(615)1642, sponsored by the Air Force Materials Laboratory, Research and Technology Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. The personnel directly affiliated with this program were Mr. D. A. Shinn, Chief, Materials Information Branch; Mr. E. Dugger, Technical Marager, Information Processing; and Mr. J. H. Charlesworth, engineer in charge of this project. Their understanding cooperation has contributed much to the success of the program.

It is sincerely hoped that Thermophysical Properties of High Temperature Solid Materials will constitute an even more valuable contribution to technology than its predecessor. This work should prove to be an invaluable source of information on an important group of properties of materials to every engineer, providing him with reliable information of a scope that would be impossible for any one individual to master. If we have been able to approach these goals, the results will be highly gratifying.

June 1966

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EXPLANATORY TEXT

I. SCOPE OF COVERAGE

Thermophysical Properties of High Temperature Solid Materials comprises six volumes. Volumes 2, 4, and 6 each consist of two parts because of the large amount of material covered. The general contents of the respective volumes are as follows:

Volume 1—Elements

Volume 2-Nonferrous Alloys

PART I-Nonferrous Binary Alloys

PART II—Nonferrous Multiple Ailoys

Velume 3-Ferrous Alloys

Volume 4—Oxides and Their Solutions and Mixtures

PART I - Simple Oxygen Compounds and Their Mixtures

PART II—Solutions and Their Mixtures of Simple Oxygen Compounds, Including Glasses and Ceramic Materials

Volume 5—NonoxiCes and Their Solutions and Mixtures, Including Miscellaneous Ceraroic Materials Volume 6—Intermetailies, Cermets, Polymers, and Composite Systems

PART I-Intermetallies

PART II-Cermeis, Polymers, and Composite Systems

The specific properties covered in each volume are:

- 1. Density (ρ)
- 2 Melting Point (M. P.)
- 3. Heat of Fusion (Ah,)
- 4. Heat of Vaporization (Δh.)
- Heat of Sublimation (Δħ.)
- 6. Electrical Resistivity (r)
- 7. Specific Heat at Constant Pressure (c_p)
- 8. Thermal Conductivity (k)
- 9. Thermal Diffusivity (a)
- 10. Thermal Linear Expansion (AL/L)
- 11. Thermal Radiative Properties:

Absorptance (a), Emittance (c), Reflectance (p), and Transmittance (7)

12. Vapor Pressure (p)

Generally, only materials with melting points above 800°K (approximately 1000°F) are included, except for materials within the categories of polymers, plastics, and composites. A detailed discussion of the material classification procedure is presented in the following sections. A Material index for the entire work is included at the end of each volume.

IL TPRC CLASSIFICATION OF MATERIALS

Materials are classified into the eight categories listed below. Whenever applicable, the compositions are reported in weight percent of the constitutents. For purposes of material classification TPRC considers the following elements as nonmetallic: H, He, C, N, O, F, Ne, P, S, Ci, A, Br, Kr, I, Xe, At, and Rn.

- 1. Elements: For the purpose of classification an element is specified as follows:
 - A. For inetallic elements, the limit of impurities is <0.20 percent for each foreign constituent and <0.50 percent total impurities.
 - B. For nonnetallic elements (i.e., carbon including graphite and dismond), the limit of imparities is ≤2.0 percent for each foreign constituent and ≤5.0 percent total impurities.
- Nonferrous Alloys: This category is for alloys in which the major constituent is other than iron. For the purpose of classification, nonferrous alloys are specified as follows:
 - A. Nonferrous Binary Alloys: The sum of the binary constituents is ≥99.50 percent and rather constituents ≤0.20 percent each.
 - B. Noeserrous Multiple Alloys: The sum of the first two constituents is <99.50 percent and/or any other constituent >0.20 percent. Alternatively, the major constituent is ≤99.50 percent and each of the other constituents <0.20 percent (or not given).</p>
- 3. Ferroit Alloys: This calegory is for alloys in which iron is greater than or equal to any other constituent. For the purpose of classification, ferrous alloys are specified as follows:
 - A. Carbon Steek: Carbon ≤2.0 percent and carbon ≥ any other alloying constituent.
 - a. Group 1: Every other alloying constituent is ≤0.20 percent except for Mn, P, S, Si, which may be ≤0.60 percent each.
 - b. Group II: At least one other alloying constituent >0.20 percent and for any of Ma, P, S, Si >0.60 percent.
 - B. Cast Irons: Carbon >2.0 percent and carbon ≥ any other alloying constituent.
 - a. Group I: Every other alloying constituent ≤0.30 percent except for Mn, P, S, Si, which may be ≤0.60 percent each.
 - b. Group II: At least one other alloying constituent >0.20 percent and/or any of Mn, P, S, Si >0.60 percent.
 - C. Alloy Steels (including alloy cast iron): The major alloying constituent is other than carbon.
 - a. Group I: Every other alloying constituent \leq 0.20 percent except (its Mn, P, S, Si, which may be \leq 0.60 percent each, and C \leq 2.0 percent.*
 - b. Group II: At least one other alloying constituent >0.20 percent and/or any of Mo, P, S, Si >0.60 percent.*
- 4. Nonmetallic Compounds and Tircir Mixtures and Solutions: Ceramic materials such as exides, beomides, carbides, carbonates, nitrides, silicates, etc., are included in this category. For the purpose of classification, they are specified as follows:
 - A. For simple compounds and their solutions, the limit of impurities is ≤20 percent for each foreign constituent and ≤5.0 percent total impurities.

Exception is made when Mn. P, S, or Si is the major alloying constituent. For instance, in the case of Fe + Mn + ZX₁ alloys
the specifications corresponding to Groups I and II would be as follows:

a. Group I: Every other alloying constituent ≤0.20 percent except for P. S. Si, which may be ≤0.60 percent each, and C ≤2.0 percent.

b. Group II: At least one other alloying constituent >0.20 percent and/any of P, S. Si >0.60 percent.

In the above example, Mn has a higher weight percentage than any of P, S, or Si but does not necessarily have a weight percentage higher than 0.60 percent. Thus, the limits of Mn percentage may be written:

Fe ≥ Mn > P, S, Si and any other alloying constituent and Mn ≥0.20.

The same guideline is applied to ferrous alloys containing P, S, or Si as major alloying constituents.

- B. For mixtures of simple composeds and their solutions, the major constituent is <95.0 percent, or any other constituent is >2.0 percent.
- 5. Literatellies: An intenstallie is a metal-metal compound formed by metallic elements in a fixed simple atomic ratio. For the purpose of classification, specifications are the same as those for Class 4.
- 6. Commo: Certatis are ceramic materials such as cartifies, oxides, etc., funed with or booked by one or more pure include. However, there are also metal-metal corpora, metal-interactable corpora, etc., which are also included in this category.
- 7. Polymers: Polymers are chemical compounds or mixtures of compounds formed by polymerization and consisting executably of repeating molecular structural units.
- 8. Compatite System: A companie system may consist of materials in combination, with citarly defined boundaries existing between components of the system, or a homogeneous material having a distinct configuration.

For the reader's convenience, the classification scheme for Classes I through 4, described above, is summarized in the following table.

SUMMARY TABLE OF TPRC CLASSIFICATION OF MATERIALS

Classifica	ition		Limits	s of Composit	ion (weight perc	<u> (at)</u>
			$\mathbf{x_i}$	$X_1 + X_2$	X ₂	X_3
γA.	METALLIC		>99,50		<0.20	<0,20
1. ELEMENTS — B.	NONMETALL	IC —	2: 95 . 0		≤2,0	≤2,0
2. NONFERROUS	BINARY ALLOYS			≥ 49.50	≥0.20	≤0.20
ALLOYS (X ₁ >Fe)		Γ		≥99,50	>0.20	>0.20
(A1 > 1 c) B.	MULTIPLE			<99.50	≥0.20	≤0.20
	ALLOY\$			<99.50	>0.20	>0,20
		L	≤99,50		<0.20	<0.20
			х.	X ₂	X3	Mn, P Sor Si
		GROUP I ——	Fe	C ≤2.0	≤0.20	≤0.60
ſ ^A ·	CARBON STEELS	г	Fe	C ≤2.0	≤0.20	>0.60
	Ĺ	GROUP II —	Fe	C ≤2.0	>0,20	≤0.6v
		L	Fe	C ≤2.0	>0.20	>0.60
3. FERROUS	CAST [GROUP I —	Fe	C >2.0	≤0, 20	≤0.60
ALMIS 7	IRONS	r	Fe	C > 2, 0	≤0,20	>0.60
$(X_1 = Fe \ge X_2)$	L	GROUP II	Fe	C > 2. 0	>0,20	≤0.60
		L	Fe	C > 2.0	>0.20	>0,60
	28	-GROUP I ——	Fe	≠ C	≤0, 20 and C ≤2, 0	≤0, 60
Lc.	ALLOYS -	-	Fe	≠ C	≤0.20	>0.60
		GROUP II ——	Fe	 ≠ C	>0,20	≤0,60
			· Fa	, ≠ C	>0,20	>0,60
4. NONMETALLIC COM	APOUNDS AND	THEIR MIXTURI	es and sc	LUTIONS		
				X_{i}	X_2	
A. SIMPLE COM	APOTENDS AND	THEIR	<u> </u>	. ≥95.0	≤2.0	
SOLUTIONS					- -, -	
B. MIXTURES O	TE GIMB! E CO	MDOUNDS	ļ	<95.0	≤2,0	
AND THEIR		THE CONDS		≥95.0	>2.0	
				L <95.0	>2.0	

NOMENCLATURE:

 $X_1 = Major Constituent$

 $X_2 = Second Highest Constituent$

 $X_3 =$ Third Highest Constituent

Where: $X_1 \ge X_2 \ge X_3 \ge X_4 \ge \cdots$

^{*}In case Mn, P, S, or Si represents X2 this particular element is dropped from the last column.

III. PRESENTATION OF DATA

Each of the six volumes consists of seven sections arranged in the following order:

- 1. Preface
- 2. Table of Contents
- 3. Explanatory Text
- 4. Conversion Factors
- 5. Body of Data
- 6. References
- 7. Material Index.

In the following paragraphs a detailed description of Sections 5, 6, and 7 is given. The contents of the first four sections are self-explanatory.

BODY OF DATA

Data on each material are presented in graphical or tabular form for selected sets of measurements, and are accompanied by a Reference Information Table with corresponding specifications and remarks. The first five properties listed in Section I of this Explanatory Text are considered as point values and are grouped together in a single table in the same manner as the graphs for the other remaining properties. Furthermore, for a given material group, where several properties are reported, data are arranged in accordance with the order of the property list given in Section I of this text.

Graphic Presentation

Data extracted from various references on a given material and property are shown on a single graph by means of distinct plotting symbols, which are identified in the Reference Information Table on the page following the graph. Each set of symbols indicates the data of a given investigator, but does not necessarily imply actual measured points. In numerous instruces authors present only smoothed values, either in graphical or tabular form, and it is frequently impossible to distinguish interpolated or smoothed values from actual observed data.

In reporting data on thermal linear expansion, investigators sometimes give a single average value of this property for a considerable temperature range. In such instances it is assumed that a linear relationship is implied. All data on thermal linear expansion were reduced to a datum of 293°K (20°C); i.e., $(\Delta L/L) = 0$ at 293°K (20°C). This point is identified by a cross (+) on each graph.

The definition of $(\Delta L/L)$ used in this work is

$$(\Delta L/L) = \frac{L_T - L_{293}}{L_{203}} \times 100$$

where L_T = length of specimen at temperature T.

 $L_{203} = \text{length of specimen at 293°K (20°C)}$.

To compute the "coefficient" of thermal linear expansion β from 293°K to any temperature T, the following relation may be used.*

$$\beta = \frac{1}{100 (T - 293)} \frac{\Delta L}{L}$$
, in K⁻¹

It is necessary to divide the right-hand side of this equation by 100 because the graphical presentation of (ΔL/L) is in percent
expansion from 29²K.

In some instances the coefficient of thermal linear expansion is reported in tabular form.

Curves drawn through the plotted points are the "most probable" curves based on the data shown. As additional information becomes available in the future, these recommendations may well be modified.

Point Value Table

Data extracted from various references are identified by distinct symbols in the same manner as data points on a graph. "Most probable" values are given either at the top of the table or are indicated in a footnote. These selections are usually made solely on the basis of the data presented. Sometimes these point values are also reported as a function of temperature or composition, in which case they are shown in graphical form and placed immediately following the tabular values.

Reference Information Table

A table giving the reference information associated with each set of data obtained in the graph immediately follows the graph. The table contains the following information:

- 1. Symbol. The plotting symbols are identical with and correspond to those used in the graph.
- 2. Reference. References are identified by hyphenated numbers which serve to locate the bibliographic citation in the section of References at the end of each volume. The initial two digits indicate the year of publication and the last digits identify the specific reference within the given year. In those instances where a reference does not carry a date, the letter symbol ND is used in place of the year of publication. Undated references are listed at the end of the list of References.
- 3. Temperature Range. Range covered by the data in a given paper or report.
- 4. Reported Error. The author's estimated accuracy (or precision).
- 5. Sample Specification. This column contains all pertinent available information about the test sample. This information consists of the following:
 - a. Commercial trade name, chemical formula, etc., followed by manufacturer's name, if it is necessary for correct identification.
 - b. Composition of the sample, expressed in weight percent. Unless otherwise stated, the percent
 - c. Physical characteristics of the material, such as a single crystal, polycrystalline, density, crystal
 - d. Specimen designation by the author is given in brackets at the end of the citation.
- 6. Remarks. This column contains information on:
 - a. Special process used in fabrication of the sample, such as being sinter id, chill-cast, etc.
 - b. Sample history, such as cold-worked, hot-pressed, annealed, etc.
 - c. Conditions under which the specimen was investigated, environment, etc.
 - d. Other pertinent remarks.

REFERENCES

The section on Reference gives complete bibliographic citations for all the references from which data were extracted. They are arranged chronologically by year of publication, and in arbitary sequence within

For the preparation of the references, the following order and convention is used.

Periodicals

- 1. Author(s) name: Last name first, followed by initials.
- 2. Journal name: Standard TPRC journal name abbreviations are used.
- 3. Series, volume, and number.

- a. If the series is represented by a letter, it is underlined together with the volume number.
- b. If the series is represented by a number, there only the numeral representing the volume is under-
- c. The numeral for the issue number is shown in parentheses.
- 4. Pages: Indicate the beginning and ending pages.

Reports

- 1. Author(s) name is given in the same form as for periodicals.
- 2. The name of the responsible organization, if any.
- 3. The name of sponsor.
- 4. Report, bulletin, or circular designation.
- 5. Number.
- 6. Part.
- 7. Pages (same as for periodicals).
- 8. AD and PB numbers or equivalents.

Books

The bibliographic citation for books lists: author(s), title, volume, edition, publisher, and page(s).

In general, private communications are not fisted as references. However, if TPRC did obtain additional substantive information from an author through private communication, and if this information was used, the remark "additional data obtained from author(s)" is added at the end of the reference citation.

MATERIAL INDEX

The Material Index lists all the materials included in this work by their proper trade or commercial names arranged in alphabetical order and, for materials designated by number codes, the listing is in increasing numerical order. Location of information on a particular property for a particular material is specified by the volume number and page number are indicated within the appropriate property column of the index. The page number always indicates the starting page of the graphs or point value tables. Chemical formulas are given in parentheses following the proper names of materials which can be chemically identified. However, for materials within a general group, e.g., different oxides of cerium, the entries are only by chemical formulas listed under the material group designation, such as "cerium oxides." Whenever applicable, an effort is made to list commercial materials under their several accepted names. In the case of broad classes of materials, such as steels, glasses, etc., the materials are listed under their common names as well as under the heading of their general class when the designation is merely a letter and number code.

or of the control of

Simpler inorganic compounds (e.g., aluminum oxide, tantalum boride) are named according to the convention given in the *Handbook of Chemistry and Physics* (The Chemical Rubber Co., 45th edition, 1964, and—if not available there—the 43rd edition, 1962). Other inorganic compounds are generally named in accordance with the convention given in the *Chemical Abstracts* by giving the more electropositive part of the name first and the more electronegative part second. For nonferrous and ferrous alloys, only the first two components are listed and ΣX_1 is added to designate multiple alloys. An exception is made, however, for chromium-nickel and nickel-chromium ferrous alloys, in which cases, all three major constituents are listed. For other inorganic compounds and their mixtures and solutions, all components with weight percent greater than 2 percent are listed. Finally, for cermets, the name of the ceramic part is given first and the metal part second, each in their respective alphabetical order regardless of their weight percentages, with the exception of beryllium cermet (e.g., Beryllium YB-9052), in which case the name of the metal part is given first.

CONVERSION FACTORS

NOTE: In preparing the conversion factors, the following basic definitions were used:

The subscripts "Th" and "IT" denote "Thermochemical" and "International Steam Table" units, respectively.

^{*} NBS Technical News Bulletin, 47(10), 1963.

^{\$} Mueller, E. F., and Rossini, F. D., Am. J. Physics, 12(1), 4, 1944.

CONVERSION FACTORS FOR UNITS OF DENSITY

_	•					
16 ft.".	6. 24.283 x 10	58608*8	6. 24283 x 10" ²	2,20462	1.72800 x 10 ³	
lb in3	3.61275 x 10 ⁻²	2, 20462 x 10 ³	3.61.276 x 10" ^{\$}	1, 27582 × 10" ³	₩	5.73704 × 10"4
kg ft."4	2.83170 x .0	1.72800	2.83170 x 10 ¹	₩.	7.83808 x 10²	4, 63692 x 10"1
kg m.**	1.0 × 10 ³	6,10284 x 10	4	3, 53145 x 10	2,76797 x 1.04	1. GO184 x 10
,	1.63872 x 10	₩	1.63872 x 10 ⁻²	, 6.78704 × 10 ⁻¹	4, 63592 x 10³	2.62496 x 10"1
g cm,	√ €	6. 10234 x 10 ⁻²	1.0 x 10 ³	3.51146 x 10" ²	3.76797 x 10	1.60184 x. 10" ²
MULTIPLX by appropriate factor to OBTAIN	g cm ⁻³	es est	g, kir Hy	kg R1	1k in. "8	115 (1.73

CONVERSION FACTORS FOR UNITS OF LATENT HEAT

Btu _{IT} lb" ^{f.}	1,79880	\$.	4. 29923 x 10"1	4. 20894 x 10"1	0,09331.x.10 ¹	*
Btu _{ffh} lb-4	4.8	1.80120	4.30210 x 10"1	4.30231 x 10"1	₹	1.00067
Jnt ^{g-1}	4, 16331	4, 1861.1	0.99835 x 10"1	₩.	2.32406	2, 32562
W see g."	4, 184	4. 1868	7	1,00017		2, 3 24
cal _{II} e ⁻²	9, 99331 x 10"!		2. 38846 × 10*1			6, 65556 x 10"1
cal _{Th} g"1	 -	1, 00067	2, 39006 × 10"‡	2, 30046 x 10" ¹	6. 65656 x 10" ⁴	6. 55927 x 10"1
MULTIPLY by appropriate factor to OSTAIN—	calyng"	cal ₁₁ K"i	W sos g"t	Jng-1	Btu _{TR} tb"1	Btu _{rr} tb ⁻¹

CONVENSION PACTORS FOR UNITS OF SPECIFIC HEAT

MULTIPLX by appropriate factor to OBTAIN—Ex	cal _m g"40"1	calyre" for	W 800 g"1K"\$.Tuts-1K1	1344, 113" 1g" 1	Bthr.113"trut
cal _{Th} g*!C-1	¥	9. 9933£ x 10**	4,184	4.18331	- 4	0. 99331 x 10" ¹
onl ₁₁ g ⁻¹ C-1	1.00007	-	4,1868	4. 18611	L. 00067	T
W 603 g"1K"1	7.350006 x 10"1	2.38846 x 10"1	4	0.08635 x 10"1	2, 3; 006 x 10"1	2, 38846 x 10" ¹
Jat8"1K"1	2.30046 x 10"1		1.00017		2, 39045 x 10"1	2,38686 x 10" ⁴
Btu _{gh} ,15° ¹ .15° ¹	4		4.184	4.18631		9.09331 x 10"1
Burry 3-4gm	1,00067		4, 1868	4.16611	1. 00067	W William Control of the Control of
	**************************************	***************************************	***************************************		<u> </u>	

Note: To convert quantities per "gram" to "mol" basis multiply conversion factor by the melocular weight M.

CONCERSION SYCHOLOGICAL SERVICE CONDUCTIONS

	Saparit.	Miller Fig.	eal _{ly} sog"tere" C"	calynascatomat Cai koalynaa maa Cai	Koalyhar" am" C"	W cm** K**
	₹.	1, 2 × 10	4. L3379 x L0" ³	4. Laggo & 10 ⁻¹	1,48016	1.73073 x 10"1
B. H. T. T. T. T. T. H. S.	8.33333 x 10"3		3,44482 x 16"4	3,44713 x 10"4	1.24057 x 10"1	1.44228 x 10"3
cal _{Fr} gor")cm"1 C"1 8,4	2,41000 x 10°	3, 90291 × 10 ³	**2	1.06867	3,60241 x 10²	4. 1868
681 _{Th} 80c" tem "1 C" 1 8.4	2,41747 x 10 ¹¹	3, 90096 × 10 ³	0.00331 x 10 ⁻¹	₹	3.6 x 10 ⁸	4.488
kenl _{Th} ur ⁴ m ⁻¹ C ⁻¹ 6.7	6.71530 x 10" ¹	8, 05934	2,7709 x 10"3	8,77778 x 10"3		1. 16222 x. 10"?
W cm" 1 K" 6.7	6.77788 x 1.0	6, 03347 x 10 ³	2.38846 x 10*t			- 4

CONVERSION PACTORS FOR UNITS OF THERMAL DIFFUSIVITY

MULTIPLY by appropriate factor to OBTAIN——	cm ² sec."	cm hr "1	_ન ે ગામ ^ક લાક	in, ¹ 3000° 1	ያኒ ^ብ ዷልነታ ^ው ች	ft h.r-1
om48ec"1	~•	1, GO 3, 10 ³	3,60 1, 10 ³ 3,60 × 10" ¹ 1,580 × 10" ³ 1,07630 × 10" ⁴ 3,87601	1.02 × 30.4	1, 07630 x, 10" ³	3.87601
cmhr"t	2.7778 x 10"4	**	1 1.0 x 10"4 4.30556 x 10" ⁴ 2.98598 x 10" ¹	4.30666 x 10"#	2. 98998 x 10"†	1.07639 x. 10" ⁸
m?hr"4	2, 17778	1.0 × 10 ⁴	1.0 x 10 ⁴ 1.07639 x 10	4.30866	2, 08008 x 10" ³	1.07630 × 10
ta. ¹ 800° t	0,45100	3. 3226 x 10 ⁴	2, 42248 x 10 ⁴ 2, 430 x 10	***	6. D4444 x 10"1	2. 50 % 10
tr ³ koo • t	0, 23030 x 10 ²	3. 34461 m 10 ⁴	s, 24451 x 10 ⁴	1.440 × 10 ³	-	3. GO × 10 ³
ftHx.	2, 580c4 x 10" ¹			4.0 x 20"?	2, 77778 x 10"4	9-1 - 1

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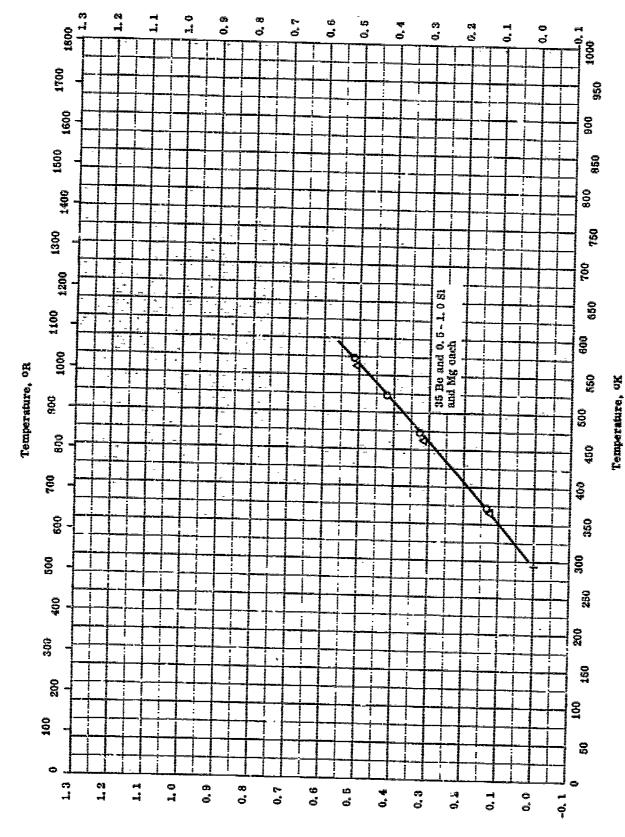
CONVERSION PACTORS FOR UNITS OF VAROR PRESSURE

. 135-332, "K			L. 42250 x 10	1. 03370 x 10"1		7
88 "u;	2, 8580 × 10 **	2, 8929 × 10	2.8560 × 10	3. 0370 x 10"2		2.0360
an man	7. 5010 × 10"4	7.60 × 10 ² 2, 8929 × 10	7.3560 x 10 ⁸ 2.8560 x 10			
kg cm.**	1.01970 x 10"*		0.6760 x 10"1	1.31680 10" ³ 1.35950 x 10" ³	3,4630 x 10" ³	7.0816 x 10" ⁸ 8.1416 x 10
140,133	D.8000 x 10"*			1.31680 . 10*3		0°80400 % 10°3
супо ст.	* *	1. 01330 x 10 ⁴	0.8070 x 1.0 ⁸	1.33320 x 10 ⁸	3.1860 x 104	G. 89470 x 104
MULTEPLY by appropriate factor to ORTAIN	dyno ens"³	atm	kg am ⁻²	mm Hg	in. Ilg	113 tm3

NAMES ALLOWS

Part I

NAVEROUS NULTIFIE ALIONS
(See of the first two constituents < 50.50 percent antique
top other constituents > 0.50 percent. Alternatively,
only constituent < 50.50 percent and each of the other
translaters effect < 6.50 percent as and given.)



THERMAL LINEAR EXPANSION --- ALUMINUM + BERYLLIUM + EX

Thermal Linear Expansion, percent

Thermal linear expansion -- aluminum + beryllium + Σx_1

REFERENCE INFORMATION

Sample Specifications Remarks	35 Be, and 0.5 - 1.0 Si, Mg each. cuonched, and agest at about 300 F; beating.	Coolings	
y'a	66. 5 Al,	Same as above.	
Rept.			
Tomp. Range ^o K		203-673	
Raf.	62-19	52-19	

Properties of aluminum +copper + $\sum x_i$

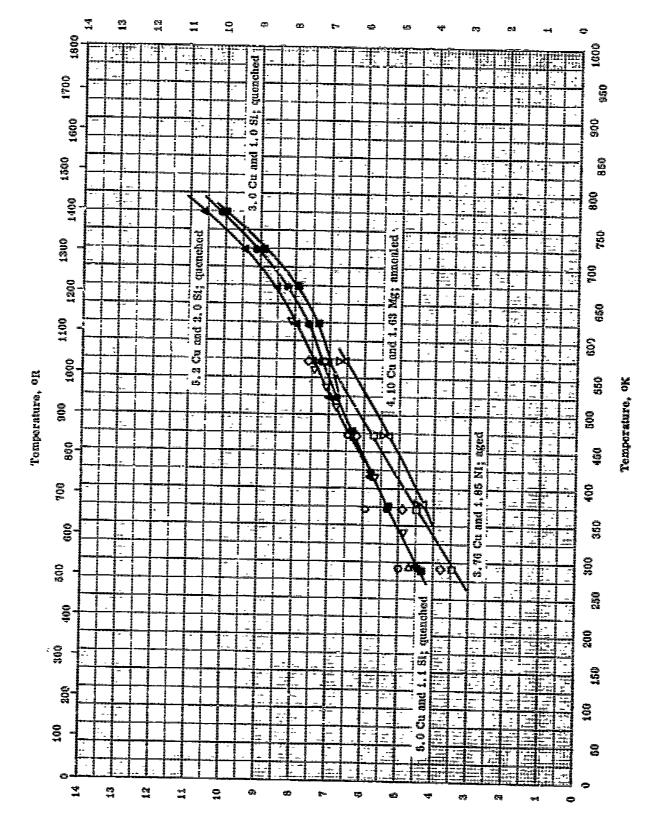
REPORTED VALUES

Dens	aity:	g cm ⁻³		lb ft ⁻⁵
0	3.8-4.9 Cu and 1.2-1.8Mg	2,779	4	173.5
	10 Cu and 1.5 Ni	2.94		184
Δ	3 Cu and 1.5 Fe	2,8		170
\Q	3 Cu and 1.5 Fe	2.8		170
•	4.5 Cu and 1.5 Mg	2.78		174
Melt	ing Point:			
	10 Cu, 1.5 Ni and 1.0 Si	794		1430
•	3 Cu and 1.5 Fe	810		1459
•	3 Cu and 1.5 Fe	810		1459
⊽	4.2 Cu and 1.0-1.3 Si	785 ±4		1414 ± 7
Heat	of Fusion:	cal g ⁻¹		Btu lb ⁻¹
₹	10 Cu and 1.5 Ni	93		167
4	3 Cu and 1.5 Fe	93		167

Properties of aluminum +copper + $\Sigma \kappa_1$

REPERENCE INFORMATION

	***************************************	-	40 ra			<i>ំ</i>	# 5 			င့်						·
	Designed	Exastly by weight and	Heated 6-12 hrs at 500 C and quenched in water at		Same as alove.	Same as above. Wrought, held 4-8 hrs at 360 C, cooled to 250 C,	saccts neated 1/2 hrs at 520-530 (forging 4-6 hrs at 525 C), water tempered, aged 20 hrs at 160 C.	and stabilized 2 hrs at 225 C.	Same as above.	Cast, held 4-8 hrs at 360 C, 4-20 hrs at 520-530 C,	stabilized 2 hrs at 225 C.	Same as abovo.	Same as akove.	Condition T4; density by weight in air and in	water. K. P. from chlatation curve with Bollearath	dilutemeter; 4 samples with different amounts of Mr +81
***************************************	Sample Specifications	Alloy 2024-5-T4; nominal composition 3.8-4.9 Cu, 1.2-1.8 Mg, and 0.3-0.9 Mn,	Alloy C46; nominal composition: 10 Cu. 1.6 Mi, 1.0 Si, 0.28 Mn, and 0.18 Tl.	Saing as above.	Same as above.	Duralite or ThermafendC3-INA; nominal composition: 3 Cu, 1.8 Fe, 0.7 St, 0.6 Mg, 0.6 Mi, and 0.16 Fr		Same as above.	The state of the s	TO SECURE THE SECURE OF THE SE		Same as abere.	Same as above.	24k Al; nominal 4.5 Ca, 1.5 Mg, and 0.6 Ma.	4.2 Cu, 1.0: 3 SA, 0.7 Fo, 0.6 Mm, and 6.36-0.97 Mg.	
Keet.	Error %							, <u> </u>								
Tomp.	Range OK	208	e 02	795	200	293		218	20		9		ri :		786780	
Ref.		T-82	8-09	403	2-03	102		20-1	50-1		102				. 10 10 10 10 10	
		<u> </u>	0		>	٩		4	\$		•	V	/ (•	Þ	



rlectrical resistivity -- aluminum + copper + 2x1

Electrical Resistivity, chm cm x 10°

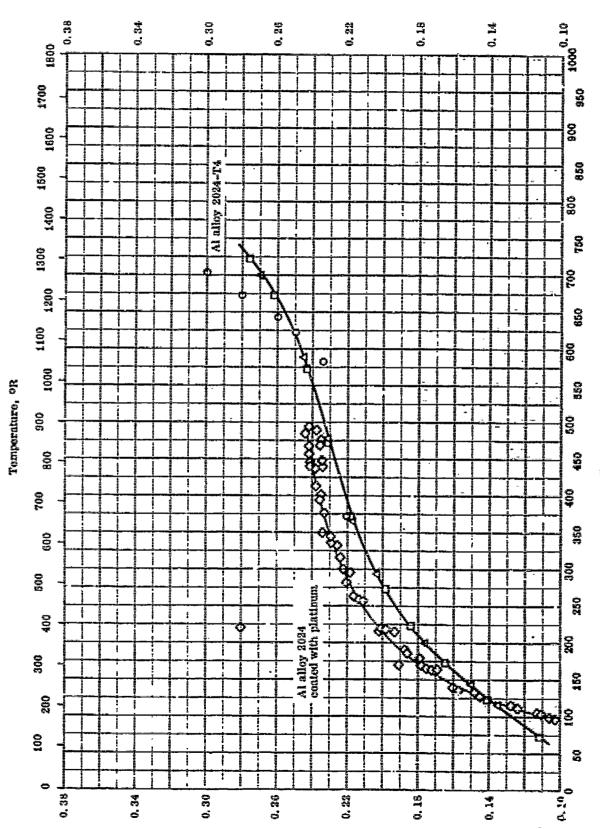
electrical resistivity -- aluminum +copper +234

REFERENCE INFORMATION

Kanary	Wrought, as recoived.	Wrought, heated to 510 G, quenched in fairly hot water, and aged at room temperature.	Annealed 1 hr at 500 C, 23 hrs at 400 C, and 40 hrs at 300 C.	Same as abover coeling curve.	Repassely heated to 300 C before test.	Wrought.	Wrought, heated 3 hrs at 525 C, quenched, and hold 16 hrs at 170 C and again quenched,	Cast, heated Ghrs at 970 F and water quenched.	Same as above.	Samo is abovo.
Sample Specifications	Al Alley "Y" (Brittsh design, k3.76 Cu, 1.85 Ni, 1.33 Mg; 0.45 Si, and 0.40 Fe.	Banno as aboren.	4.10 Cu, 1.63 Mg, 0.1 Fo, 0.06 St, 0.05 Zn, 0.064 Tf, and traces of Mn.	Same as above.	4.28 Cu, 1.59 Mg, 0.36 Fe, 0.16 Si, 0.02 Zu, 0.01 Ma, and 0.007 Ti.	Aluminum alloy RR59 (Brit. design.); 2.31 Cu., 1.46 Mg, 1.23 Fq. 1.20 Mi, 0.88 St. and 0.07 Tt.	Samo da akovo.	8.02 Cu. 1.06 Si, 0.16 Fo, 0.08 Zn, 0.03 Tl, and truces of Mg, Mn.	5.34 Cu. 2.10 Si. 0.15 Fo. 0.05 Zn. 0.02 ft and traces of Mg.	3.0 Cu, 0.99 Si, 0.15 Fe, 0.05 Zu, 0.02 TV, and traces of Mg, Mn.
Kopre. Error %			es •	2 2 4	84 0 41					
Tamp.	203-673	202-673	381-876	920-180	343626	***************************************	***************************************	293-1073	293-1073	2031073
Ref.	482	6. 6.	÷ + + + + + + + + + + + + + + + + + + +	9-79	4-10	- O	4	48-1	4 • 8	T 8 T
<u>58</u>	0	D	4	Þ	\$	Δ	\$	•	4	8

Specific heat -- Aluminum + Coppen + Em





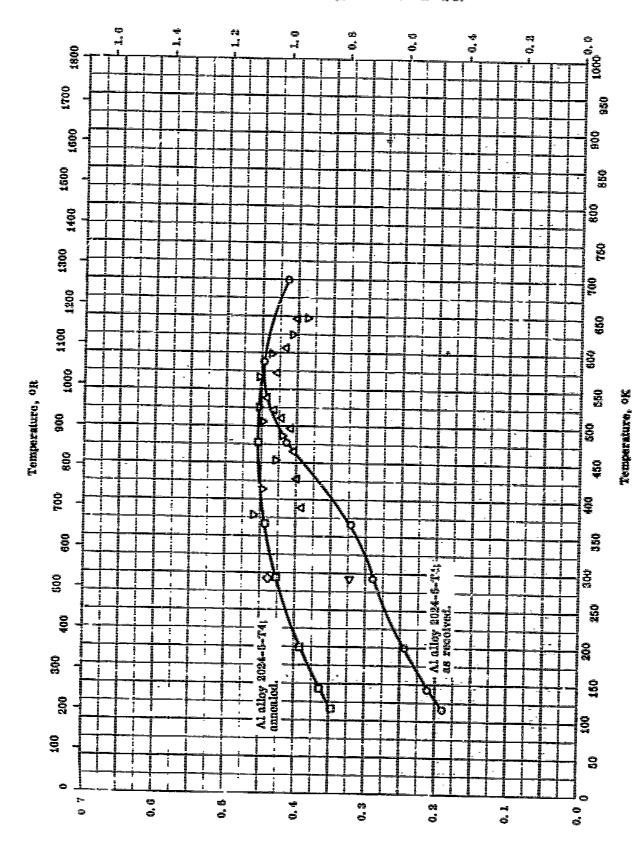
Specific Heat, cal g-1 K-1

Specific heat -- aluminum + copper + 134

REFERENCE INFORMATION

_								ž –							 	
Bemarks	Not worked, unnealed several hrs at 500 C in	during test 2 C mm"1,	:	Soaled under hellum atmosphere.	Hanova Elquid platinum applied on specimen's front	surface for opsiguences then palated with Farson	black for constant absorptivity; Hanova Hould	paratasan seamango wero apparen maso on spedimenty m rear surface for good condactive surface.								
Sample Specifications	4.31 Cu, 0.29 St, 0.14 Fe, and teases of other impurities.	•	Al alley 243 T4; 93, 4 Al, 4.5 Cu, 1.5 Mg and 0.6 Mn.	Al alloy 2024-114; 03,4 Al, 4,5 Cu, 1,5 Mg, and 0,6 Mn.	90.0 Al. Al Bloy 2024.							ŧ	e.			
Representation					6.8.0							 				
Tomp. Rango ek	372-703		48.48	116-760	07402											
Rof.	40.4		21-t-0	##8	62-16					-		 				-
	0		0	4	•					-	-				 	

Thereal convidints - Aluming + Copyet + Ex



Thermal Conductivity, cal Sec-1 cm-1 K-1

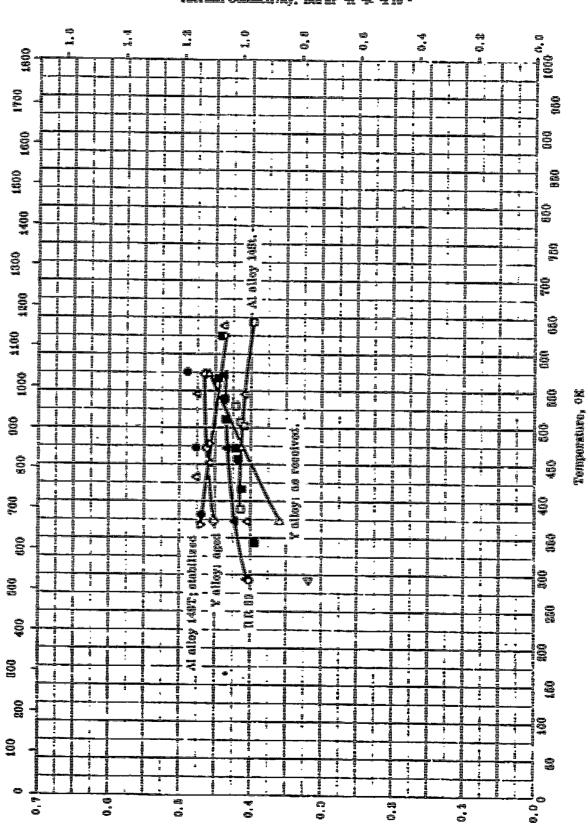
Thisteans comprestry in ... alareathm - coppeer + 12x4 (bluntam alloy 2001)

REFERENCE INFORMATION

Korrollika da marani karani karan Korrollika da marani karani karan		edecimated after becaling to 1776 P.	Rented from ringin conditions to max. tompora- ture of TOT fr.	The above sample cooled to reen temperature and then repeated the above beat freatment.	Condition - TA - The	Condition - Camealed.	
Randomental magnetic of the control	Alalloy 20 nominal	Canab as alsove.	Alukkay 2481 4. B Cut. L. B Mgr. und O. 6 Ben.	Same as above.	Al alloy 248.	Runo as abovo.	
Krror %			44	-		⇔ ₹	
Tamp. Range 9K		117-700	387-648	36. 78	808	348	
Rof.	08-1	1-86	#•10	61.3	49.1	46ml	
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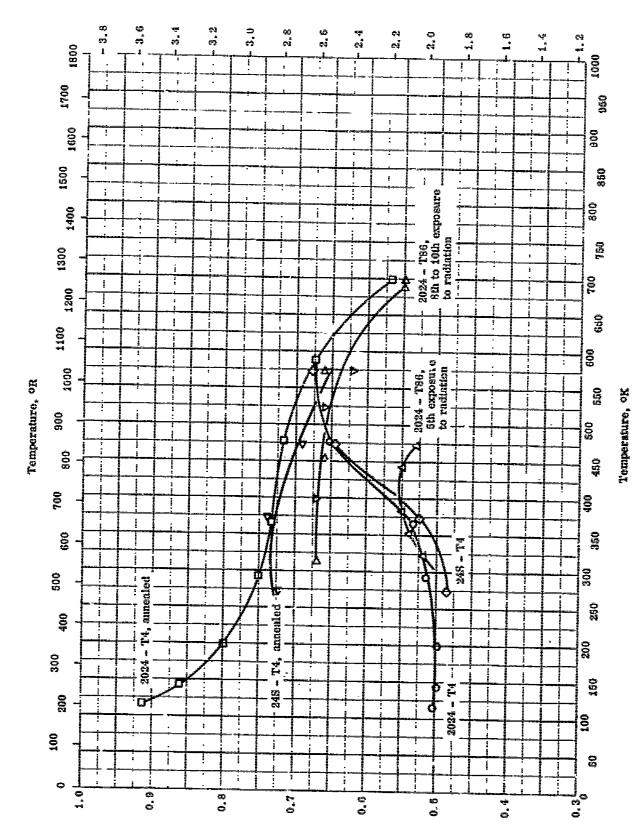
· gline ' · · · ·

THERMAL CONDUCTIVITY -- ALU INUM + COPPER + EX

REFERENCE INFORMATION

Remarks	Some results for cast and wrought samples.	Healed from virgin condition to max, temperature of 700 K.	The above sample measured after cooling to room temperature.	Stabilized for 50 hrs at 775 F.	Pro-heated for 6-12 hrs at 500 C and water quenched,	hs received.	Heated to 511 C, quenched in hot water, and then aged at room temperature.	Annealed I hr at 500 C, 25 hrs at 400 C, and 40 hrs at 300 C.	Repeatedly heated i side the apparatus until middle of the red was at 300 C.	Heated 2 hrs at 525 C, quenched, and then heated 16 hrs at 170 C and again, quenched.
Sample Specifications	Durality or Thermafond C3-INA; 3 Cu, 1.5 Fe, 0.7 Sl, 0.6 Mg and Ni cach, and 0.15 Tl.	Alalloy 145T: ', 4 Cu, 0,8 Sland Mr. each, 0,4 Mg.	Same as above.	Same as above.	10 Cu, L. 5 Ni, I Si, 0.25 Mn, 0.15 Ti; density 184 lo ft ⁻³ .	Aluminum alloy (Yalloy, British design.); 3.76 Cu, 1.85 Ni, 1.33 Mg, 0.45 Sl, and 0.40 Fe.	Same as above.	94.06 Al, 4.10 Cu, 1.63 Mg, 0.10 Fe, 0.06 St, 0.05 Zn, 0.04 Ti, and trace Mn.	93.60 Al, 4.25 Cu, 1.59 Mg, 0.25 Fe, 0.16 Si, 0.02 Zn, 0.01 Mn, and 0.007 Tr.	RR 59, (British desi _b .:); 2, 31 Cu, 1, 46 Mg, 1, 23 Fo, 1, 20 Ni, 0, 88 Si, a, 4 0, 07 Ti.
Rept. Error %		ਪੰ ÷:	रू न	-4 -4			_	6 # V	⇔ # V	_
Temp. Range ^O K	04 09 00	367-645	367645	367-645	23 24 88	293573	293-673	373-676	343-626	269-575
Ref.	20	51-3	51-3	27-3	20-5	40 5.2	40-2	* 	514	48.2
% 20 10 10 10 10 10 10 10 10 10 10 10 10 10	0	0	٥	D	∇	۷	\lambda	•		4

Thermal diffusivity -- aluminum + copper + 2 %

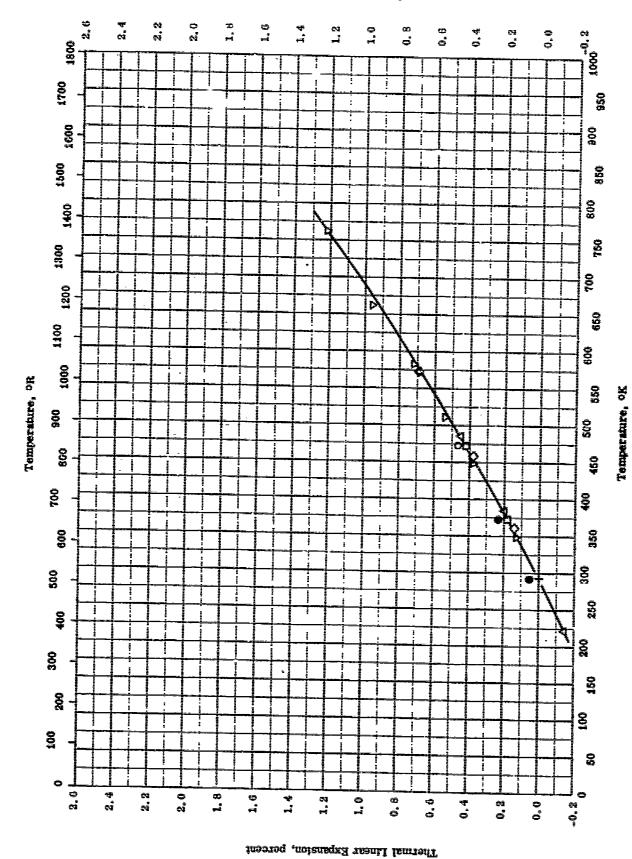


Thormal diffusivity, om² Sec⁻¹

THERMAL DIFFUSIVITY -- ALUMINUM + COPPER + EX (

REFERENCE INFORMATION

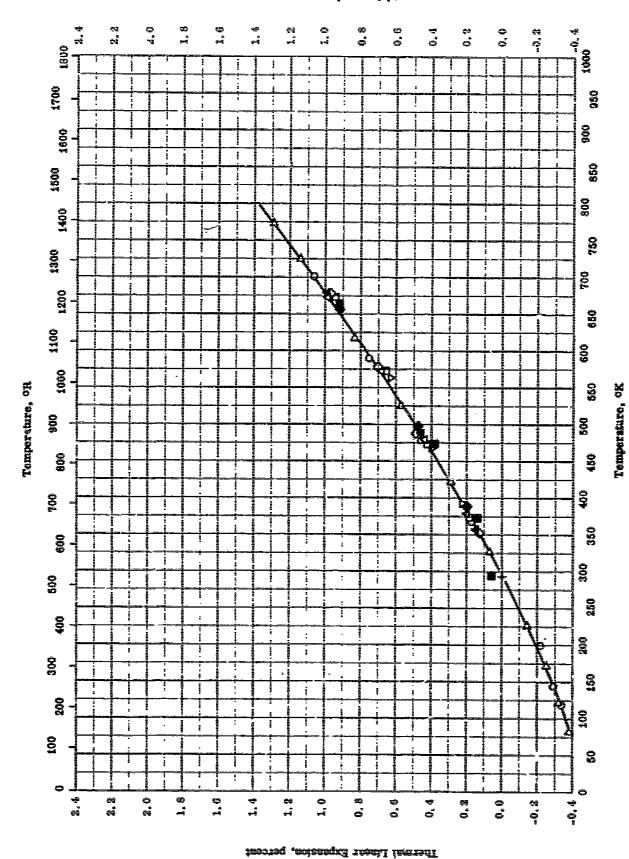
Remarks	As received.	The above sample heated above 575 F.	Measured after five exposures to radiation and followed by cooling.	The above sample after eight exposures to radia. Usen and followed by cooling.	The above sample after ten exposures to radiation and followed by cooling.	Annealed at 450 C.		
	As re	The u	Maassu folka	The all	The a	Annen		
Sample Specifications	2024-T4; 4. 5 Cu, 1. 5 Mg, and 0. 6 Ma.	Same as above.	2024-T86; 3, 8-4, 9 Cu, 1, 2-1, 8 Mg, 0, 3-0, 9 Mn, 0, 5 max Fo, 0, 5 max Sl, 0, 25 max Zn, 0, 1 max Cr, and 0, 05 max onch and 0, 15 max others in total; composition from Motal's Handbook.	Same as above.	Same as above.	24 S; 4.5 Cu, 1.5 Mg, and 0.6 Mn.	24 S-T 4; 4, 5 Cu, 1. 5 Mg, and 0, 6 Mn.	
Rept. Error %								
Tomp. Range ok	116-700	116-700	323-473	398-673	313-698	273573	273-573	
Ref.	T-89	28-7	67-1	1-29	57-1	7-95	26-1	
\$ <u>\$</u>	0	0	4	D	Δ	Ø	⋄	



Thermal linear expansion - aluminm + copper + $2x_i$ (3-12 Cu and 0.4-1.5 Fe)

Thermal linear expansion -- aluminum + copper + Σx_k (3 - 12 Cu and 0.4 - 1.6 Fq)

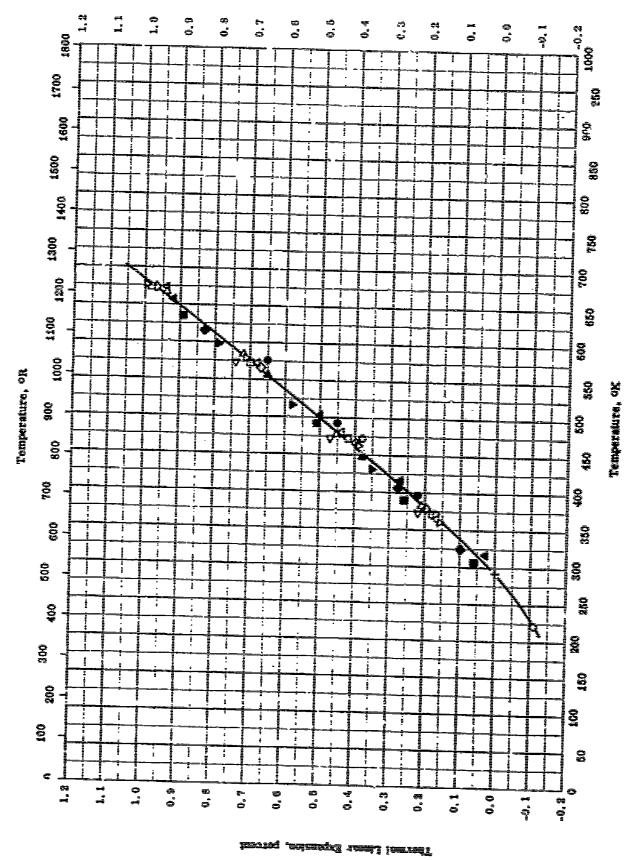
			makaan Maandaa			
!	fK? I.	Range SK	Error %		Management of the second of th	-
	62-10	203-473		88.3 A1, 10,09 Cu, 1,14 Fo, 0,26 Ms. and 0,31 St	AVITAGES E	7
	63-19	203473		Garra O.S. Garra Co.	The Control of Control	
	62-10	27-034		Saine as above.	Coolings	
					Cast, heated to 750 %, and cooled vary slowly; heating and cooling curves are graphically iden-	
	5210	223673		89.3 Al, 0.0 Cm, 1.0 Fo, 0.4 Sl, 0.3 Mg, and 0.03 Mn.	Cast, heated 20 hrs at 225 C. sternmented	
	62-19	223673		87.30 Al, 11.88 Cu, 0.43 Fo, and 0.39 St.	Cast, heated to 600 C, cooled slowly, retreated to	
					300 C, cooled slowly; this sample and the follow-ing four samples gave both heating and expline	-
	52-10	223-673		89, 23 Al. 9, 35 Ch. 5, 55 m. 5, 55 ch. 50	curves graphically Identical to above.	
	03-10	220-628		Charles An an Open and the charles of the charles o	Tratmont carac as above.	
	68-10	2000 2000 2000 2000 2000 2000 2000 200			Samo as above.	
	62-19	223-673		03.41.41. 5. 31 Cu. 0.43 Fa. say to ca ca	Same as above.	
	60-1	203-873		Thorns dond C3-174A; 3 Cu, 1, 5 Fe, 0, 7 St. 0, 6 Mi.	Same as above.	
		-			C, water quenched, and aged 20 hrs at 120 C, 2	
	G64	203-773		17 STAll nominal 3, 5 - 4, 5 Cu, 1 Fe, 6, 4 - 1, 0 Mn, 0, 8 SI, 6, 2 - 0, 8 Mn, 0, 9 SI,	Mark an alab (a).	
				The control of the district of the control of the c		



Thermal Linear expansion -- Aluminum + Copper + Ex₁ (3-- 5 Cu and 1 - 3 Mg)

Thermal linear expansion -- alumintm + copper + $\mathbb{Z}X_1$

	Remains	Tosted in vacuum,	Solution heat-treated 1 hr at 920 F, water quenched, and aged at room temperature; heating.	Cooling.	Same treatment as above: then aged 100 hrs at 70g P	heating.	Cooling.	Same treatment as above: then aged 500 hrs at 800	F. henting.	Cooling.	. 23 Wrought, heated 2 hrs at 525 C. quenched, aged 16 hrs at 170 C. quenched.	<u> </u>	argon.			
	Sample Specifications	Alalley 2024-5-T4; nominal: 3.8 - 4.9 Cu, 1.2 - 1.8 Mg. and 0.3 - 0.9 Mn.	53.09 Al, 4.41 Cu, 1.41 Mg, 0.67 Ma, 0.25 Fe, 0.10 Sl, 0.02 Zr, ard 0.01 Ni, Cr, Fb, Bi each.	Samo na nbovo.	Same as above.		Banno as almond.	Вакно пв причо.		Samo as abovo.	Aluminum Alloy Ruso (British dosig.) 2. 31 Cu. 1.46 Mg, 1.23 Fo, 1.30 Ni, 0,88 Si, and 0,07 Ti.	Aluminum alloy 24S; nominal: 4.5 Cu, 1.5 Mg, and 0.6 Ma.				
who were the second statement when the second	ETTTE %			**	14.Ē					<u>se</u>	<u> </u>	_€	_			
инасандина анаПашия	Baza ek	130-700	203-673	220-02	282-673		800-043	220-022		200-673	ereere	68773				
	I	# #	62-15	61-89	42-10		0 1 0 0 0 0	22-10 -88		67 69 40	\$.	9-¥9		<u> </u>		
	3	0	0		⋖		4	\$	4	•	Þ	Δ		 :		



Thermal linear expansion -- aliminum + copert + ex. (8-10 cu ard 1.8 m)

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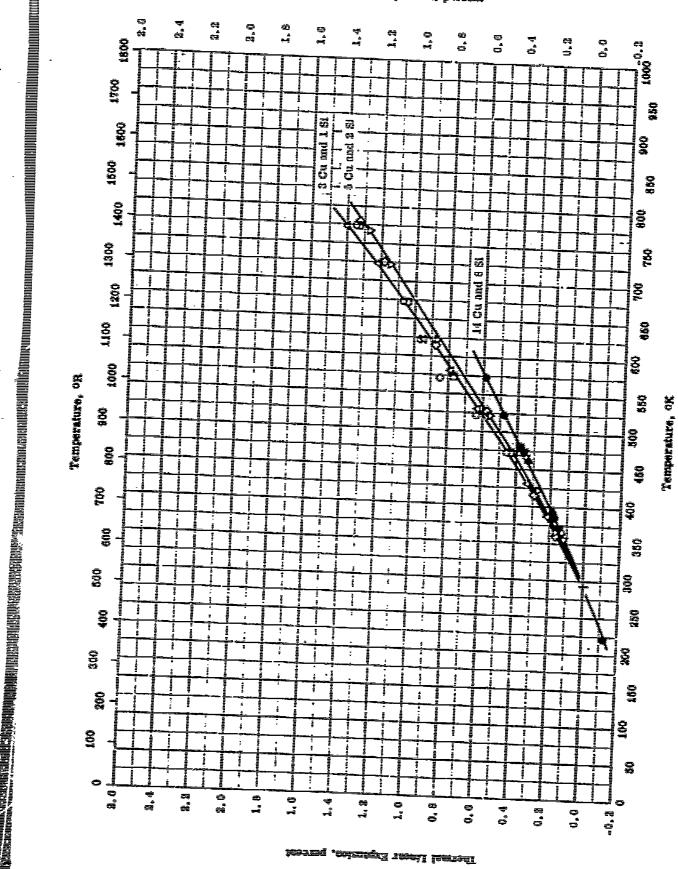
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Theresal linear expansion — alternat + copper + $\mathbf{E}\mathbf{x}_i$

	B	18.05.	Manual Markey.	Market St.	тапинатина Карада "Карадараны правинения применения применения применения применения применения применения применения применения	ДАЛЛАК КИВО СОВЕТИВНИКИ СИВЕТИВНИКИ СИВЕТИВНИКИ СИВЕТИВНИКИ СИВЕТИВНИКИ СИВЕТИВНИКИ СИВЕТИВНИКИ СИВЕТИВНИКИ СИ В ВОЛЛАКИ СИВЕТИВНИКИ СИВЕТИВНИСИ СИВЕТИВНИ
62-10 203-673 68.23 Al, 3.08 Cb, 2.01 NI, 0.04 BB, 0.45 Fo, 0.06 Mn, 0.03 Zn, and 0.01 GF, Pb, BI, Ti each. 62-10 203-673 Same as above. 63-10 203-673 Same as above.	0	6219	153-453		77.00 Al. 7.21.04, 7.18 NI, 6.78 St. axd 0.84 Fo.	_
62=10 203=673 Same as above. 62=10 203=673 Same as above. 63=10 203=673 Same as above. 60=2 303=873 Al alloy No. Ca-46; 10 Cu. 1. 6 Ni. 1.51, 0.28 Mn, and 0.16 Ti; density 184 1b ft ² . 60=3 303=873 Continued onto mest maco.	0	82-10	102-673		62, 33 Al. 3, 08 Cm, 3, 01 M1 0, 04 Mg, 0, 88 Sl, 0, 48 Fe, 0, 05 Mn, 0, 63 Zm, and 0, 61 Cm, Ph, M1 T anch.	Selukton heat-trented I he at 800 Perekor quanchod, and aged 10 hes at 340 F; hasting.
62-10 a03-673 Same as above. 64-10 a03-673 Same as above. 66-10 a03-673 Same as above.		03-10	220-672		Startage that takeneds.	Cooking.
68-10	4	0 1-8	200-073		Sanno na akavo.	2
62-10 63-10 63-10	4	28-10	144.eva		Same as alsove.	Cooling.
68-10 88-10 88-10 88-10 88-10 88-10 88-10 88-10 89-10 80-8 80-8 80-8 80-8 80-8 80-8 80-8 8	•	00-10	619-608	_	Sarno da akavo.	Samo treatment as akavo, then aged 500 krs at 800 F: heatlag.
82-19 893-673	•	6830	253-673		Saros na abavo.	Cooling.
82-10 202-673 Same as above. 82-10 202-673 Same as above. 82-10 203-673 At alloy No. C-46; 16 Ca, 1, 5 Ni, 1.51, 0.23 Nin, and 0.16 Ti; density 184 15 ff ⁻¹ . (Continued onto next, nace)	Þ	57-86	200-20		01, 56 A1, 3, 50 Cu, 3, 14 Ni, 1, 43 Aig, 0, 88 Si, 0, 51 Fo, 0, 03 Ti, 0, 02 Zi, 0, 01 Mi, Cr, Pb, Bi cach.	Same treatuent as above then aged 10 hrs at 346 Ft herding.
\$2-10 262-673 Same as above. \$263-673 At alloy No. C-46; 10 Cq, 1.5 Ni, 1.51, 0.33 Mn, and 0.15 Ti; density 184 15 IV-1. (Continued onto next, nace)	>	03-TD	100mg13		Same as akovo.	Cooling.
68-16 863-673 Al alloy No. C-46; 16 Ca, 1. S Ni. 1 St., 0.33 Mn, and 0.16 Ti. donatty 184 15 ft ⁻¹ . (Continued onto next, nace)	Δ	01-10	200-013		Same as above.	Same treatment as above, then aged 10 ars at 796 F: heating.
80-8 805-879 Al alloy No. C-46; 10 Cu, 1,6 Ni, 1.51, 0.28 Mn, and 0.16 Tit density 184 15 ft ⁻¹ .	A	88-10	20070		Santo de arbavo.	'oollug.
(Contitued onto mast made)	₹	#00	803-873		Al alloy No. C-46; 10 Cu, 1.6 Nl, 1.51, 0.33 Mn, and 0.16 Tl; density 184 15 ft ⁻¹ .	Prohonted 6 - 12 hrs at 500 C; water quenched.
AN LIMAT ANDREAS ASSESSMENT OF THE PROPERTY OF					(Continued onto next page)	

Thermal Linear expansion -- Aluminum + Copper + DX, (Continued) (3-10 Cu and 1-8 m)

Kanaara	Aluminum "y" alloy (British Daolgn.); 3.76 Cu., 1.89 Ni, 1.33 Plotted data average of two samples (within a n. 5%); Afg. 9.46 Si., and 0.40 Fo. (a) Wrought (b) Hested 510 C, quenched in bot water, and aged at recom temperature.
***************************************	Plottest data av 0. 1893; c (a) Wrough (b) Heatest inged at recent
М	Aluminum ''-y'' ailoy (Belthali Doolgn.) i 3."6 Cu, 1. 69 Ni, 1.33
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202	antoy (British
	Alumbana '''''' Nig. 0. 48 Si.
Kept.	
Range State Control Co	372-873
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Thermal Linear Expansion -- Aluminum 4 Copper + 13X₁ (3 - 14 Cu and 0, 0 - 10 Si)

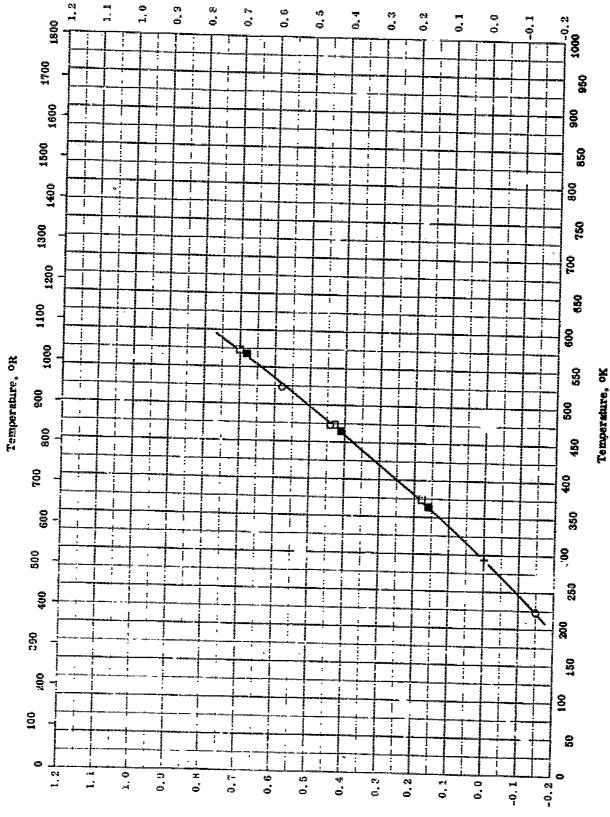
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Therest linear expansion - Alteriner + Copper + D.C. (4- L4 Cu and 0, 0-- 10 SI)

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46-1 803-775 Kuno aa abavo. 46-1 803-775 Kun aa abavo. 46-1 803-775 Kun aa abavo. 46-1 803-775 Kun aa abavo. 46-1 803-775 Kun aa aa abavo. 46-1 803
Henting rate 1. 8 C per inth initial tant, Become heating. Second heating. Cart. hold 6 hrs at 620 C, and water quanched; heating. Cart. hold 6 hrs at 620 C, and water quanched; heating. Cooling take of above opecimen. Heating take of above opecimen. Sooling take of above opecimen. Normalized 1 hr at 400 C and cooled stawly.
hearing rate 1. & C por min, initial tant. Second hearing. Grat, held 6 hrs at 340 C, and water quenched; Second hearing. Grat keld 6 hrs at 520 C, and water quenched; hearing rate 1. & C por min. Cast ke trea model heating. Cooling data of above opecimen. Heated to 400 C, cooled very slowly; heating. Cooling data of above specimen. Normaliaed 1 hr as 400 C and cooled slowly.
Socond heating. Min. Min. Min. Samo as above. Gooling data of above specimen. Heated to 400 C. cooled very alowly; heating. Gooling data of above specimen. Heated to 400 C. cooled very alowly; heating. Gooling data of above specimen. Heated to 400 C. cooled very alowly; Samo as above. Gooling data of above specimen. Heated to 400 C. cooled very alowly. Normalized I hr as 400 C and cooled slowly.
d'traces of Nfg. Cack, hold 6 hrs at 310 C, and water quenched; Besond heating. Cant, hold 6 hrs at 630 C, and water quenched; Cast to iven mold, heating. Cooling take of above operatuen. Hoated to 400 C, cooled very claring. Cooling take of above operatuen. Normalised thr as 400 C and cooled starky.
Recood heating. Traces of Nig. Cart. hold 6 bys at 630 C. and water quanched; Restling rate 1. 6 C per min. Cast ke ires mold; heating. Cooling this of above specimen. Heated to 400 C. scoled very slavely; heating. Cooling the of above specimen. Normalised 1 by 30 C and cooled slavely.
Second heating. Cart. hold 6 hrs at 646 C. and water quanched; Cast ke iron mold; heating. Cooling take of above specimen. Heated to 460 C. cooled very slowly heating. Cooling this of above specimen. Normaliand L hr at 400 C and cooled sterify.
l'tracos of Mg. Cart. hold 6 hrs at 620 C. and water quanchest. Cast la tres moidt heating. Cast la tres moidt heating. Cooling this of above operatmen. Rosinalised thr so 400 C and octon stary.
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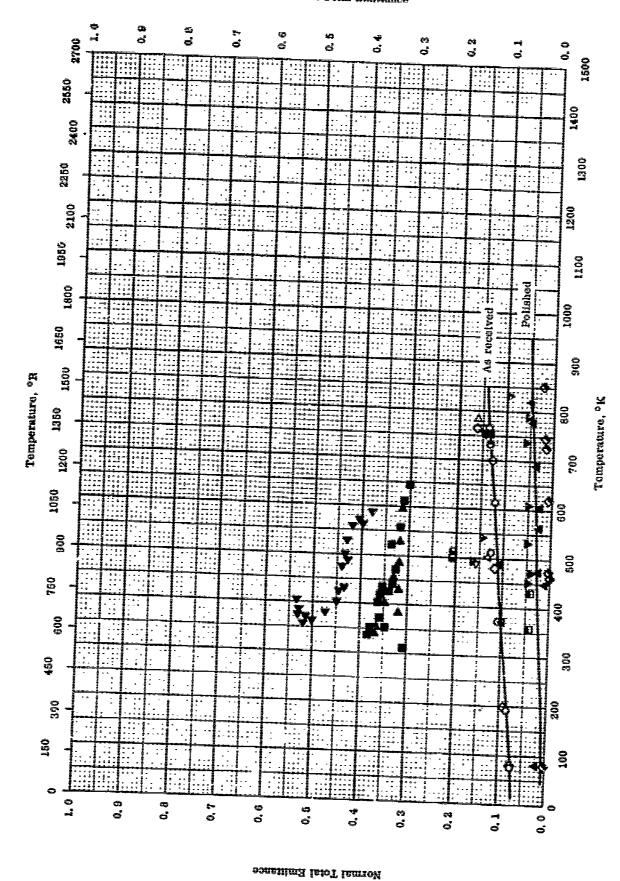


THERMAI, LINEAR EXPANSION -- ALUMINUM + COPPER + Σ_{1} (1.8 Cu and 1.3 Sn)

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- ALUMINUM + COPPER + ΣX_1 (1.8 Cu and 1.3 Sn)

1 1					 			
Kanarks	Sand cast.	Rolled, heated 2 hrs at 650 F, furnace-cooled; heating.	Cooling.			**************************************		
Sample Specifications	94.0 Al, 1.8 Cu, 1.3 Sn, 1.1 Zn, 0.6 cach Mg, Fe, 0.23 Tl, 0.2 cach Cr, Si, and 0.02 Mn.	Same as above.	Same as above.			-	-	
Ropt. Error %								
Temp. Range ok	22 22 24 24 24	223673	22373		 2 - 2			
Ref.	52-19	52-19	52-19		 · · · · · · · · · · · · · · · · · · ·			
E SE	0	0	8					



normal total emitance -- aluminum + copper + ex;

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normal total emittance -- alcheinum + coperr + $\mathbb{E} \mathbb{X}_l$

	Rof.	Tomp. Runge ok	Rept.	Sanda	Manufacture de la company de l
0	64-87			Aluminum alloy 24 ST; nominal composition: 4.8Cu, 1.3 Mg. 0.6 Mn.	As received; wiped; measured in helium (10 mi- orons); cycle I heating.
٩	64-27	808		Same as above.	Cycle I coeling.
0	64-27	766		Same as above.	Cycle 2 heathg.
Þ	54-27	404		Same as above.	Cycle 2 cooling.
٥	6427	84~766		Same as above.	Sorubod, washed, and whost; measured in beliam (10 mierons); eyele I heating.
V	64-87	480		Samo as above.	Cycle 1 cooling.
Δ	56.27	200		Enno as abovo.	Cycle 2 heating.
9	84-27	61.1		Same as above.	Cycle 2 cooling.
4	54-47	36-7-85		Same as above.	Polished to a mirror like flatsh and eashed; meas— ured in helium (10 mierous); eyele I heating
9	14-16	000		Same as above.	Cycle 1 cooling.
•	64-27	7.0		Samo as above.	Cycle 2 heating.
4	54-27	64 44		Same th above.	Cycle 2 cooling.
•	64-27	200		Samo as abovo.	Cycle 3 nenting.
5	\$4-27	489		Same as above.	Cycle 3 coeling.
\$	87-48	608-88	0	Aluminum alloy 24 ST, Abelast,	As recolved; measured in vacuum (5 x 10" imm 11g).
				(continued onto next pago)	

Normal Total emittance -- aluminum + copper + $\mathbf{E}\mathbf{x_{i}}$ (continued)

REFERENCE INFORMATION

87-48 Rauping OK Error % Sample Spootfloatlons 87-48 83-823 ± 10 Aluminum alloy 24 ST, Alchad, 85-34 368-801 Aluminum alloy 24 ST, Alchad, 65-34 300-596 Aluminum alloy 24 ST, Same as above. 44-1 301-453 ± 10 Aluminum alloy 24 ST, Same as above.	Alleganian		Bloadured Moderatori in vrotum (6 x 10° ^c m) 14° c.	for cleaned (with liquid detergent) and polished (with time polishing compounds on a builting wheel), Oxidized in air at red heat for 30 min.; measured	in vacanum (B x 1.0" (unum Fig.) .	Wilson I would be the shifted with the shifted the shifted the shift of the shift o	Same of the state				
### ### ##############################	- 5		Aluculanua alloy 24 ST	Aluminum alloy 24 ST. Alolad.	Aluminum alloy 22 ST.	Aluminum alloy 24 ST.	Same as above.	Aluminum alloy 24 ST.			
### ### ##############################	senemkensekihuenn	Error %	2 #	9	·						
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	иппетивенения ТЭ д. С	10°E.		S748	66-34 46-34	66-34	₹6-00 0	## ## ## ## ## ## ## ## ## ## ## ## ##			
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Normal Spectral Emittatee

normal spectual entitance -- alchinum + copper + Ex.

Wavelength, microna

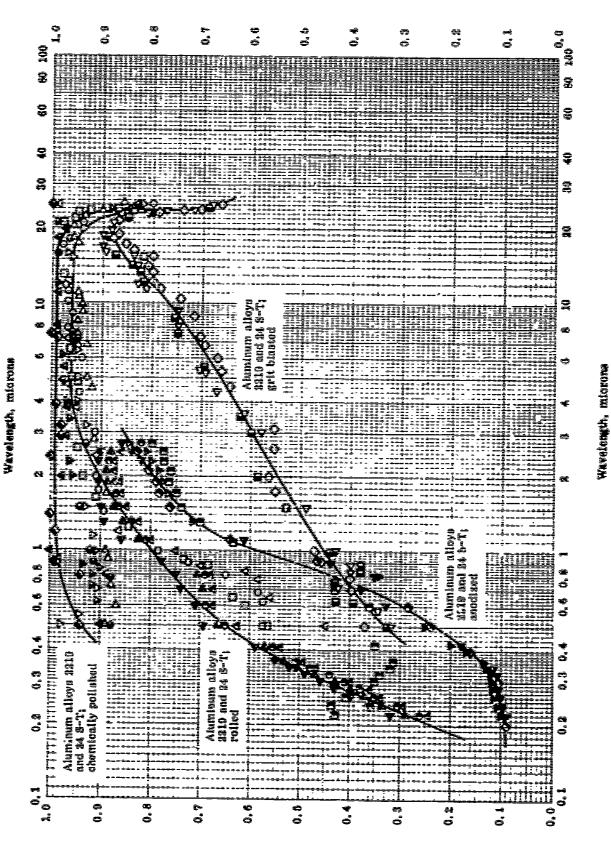
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			Madellett in the open.	Recurred in otherma	Menabergal in maragren.	
	r 96 - Herold III or a State Die Sta	Abandum alloy 2024: nominal composition: 4.8 Cu. 1.8	Ermo ng akovo: surfaco roughnoss: 0.009 and 0.071 mi- erous in x and y directions respectively.	Same as above surface roughness: 0.046 and 0.038 mi	Some as abave; surface roughness: 0. 162 and 0. 178 mi- erons in a ssi y directions respectively.	
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normal spectral repletectance -- aluminum + copper + Em

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(of 4.8. Lo-s man like for D4 lives.
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q		9 0 0 0	• • • • • • • • • • • • • • • • • • •		and al	Chonstonin poliminal
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normal spectral replantance -- alminum + copper + In (comfined)

ARENES INFORMATION

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					or is also us at the constant and us a the	lower air, froshly suspined light as standard.
4	######################################		# "G8" 'C		A. L. Millery R. M. W. T.	Clean velled; expessed to C. R. At-1 11g
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						MgC an standard.
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						Inny radiation for 60 hear monaured in
						10-8 mm Mg or lower als freshly smoked From as secondari
4	C7-T0	# 62 ST	6. 8. 8.		A to the contract of the contr	which which is a second of the
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NORMAL SPECTRAL REPLECTARE -- ALBERTRIK + COPPER + 238, (contrast)

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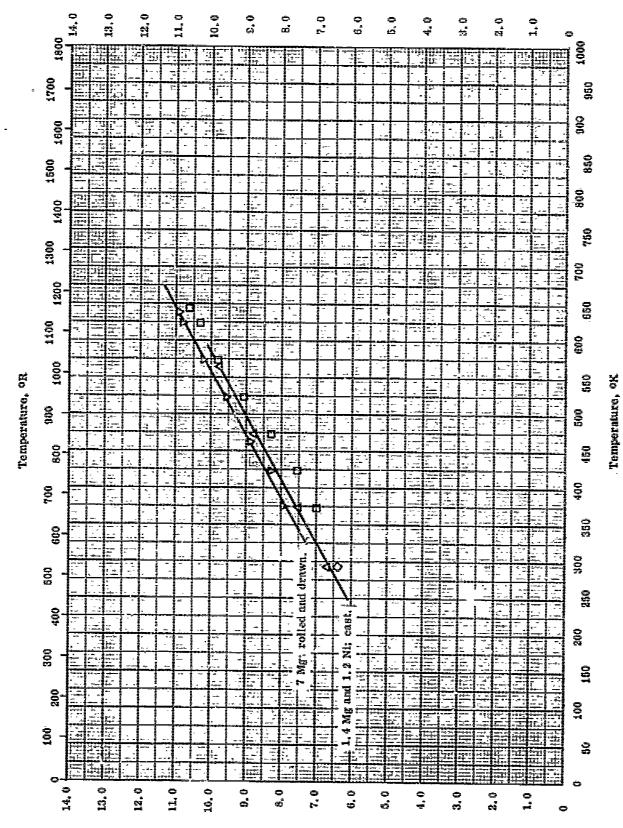
PERFECTES OF ALUMINUM + MAGNESIUM + $\Sigma \hat{x}_{ij}$

REPORTED VALUES

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₹	5 kg ==== 0.4 k=	\$	1527

PROPERTIES OF ALUMINUM + MAGNESIUM + ΣX_1

electrical resistivity -- aluminum + machesium + $2x_i$



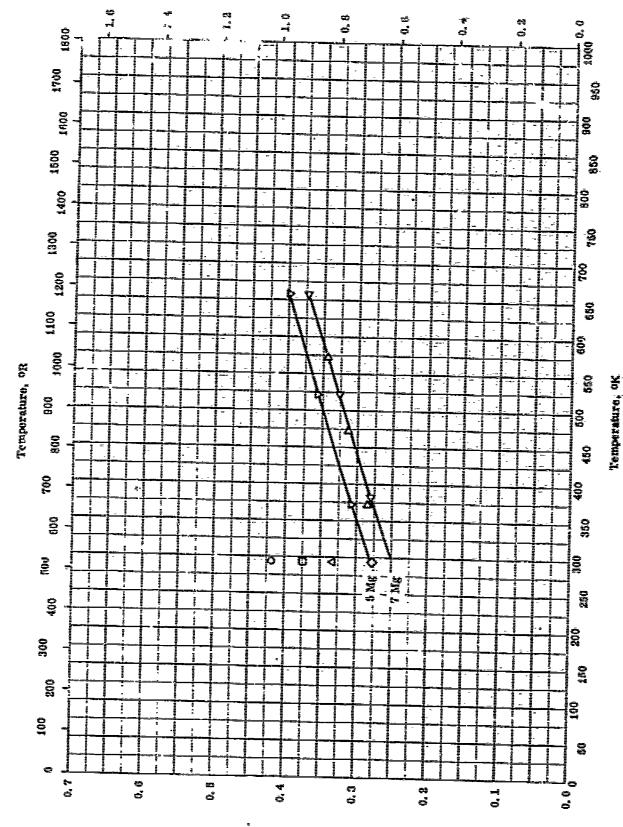
Electrical Resistivity, ohn cm x 10⁶

electrical resistivity -- additinum au magnesium + au_{k}

REFERENCE INFORMATION

Parameters and properties and the control of the co

Thermal compucativity --- Alminum + magnesium + EX



Thermal Conductivity, cal $50e^{-1} \, \mathrm{cm}^{-1} \, \mathrm{K}^{-1}$

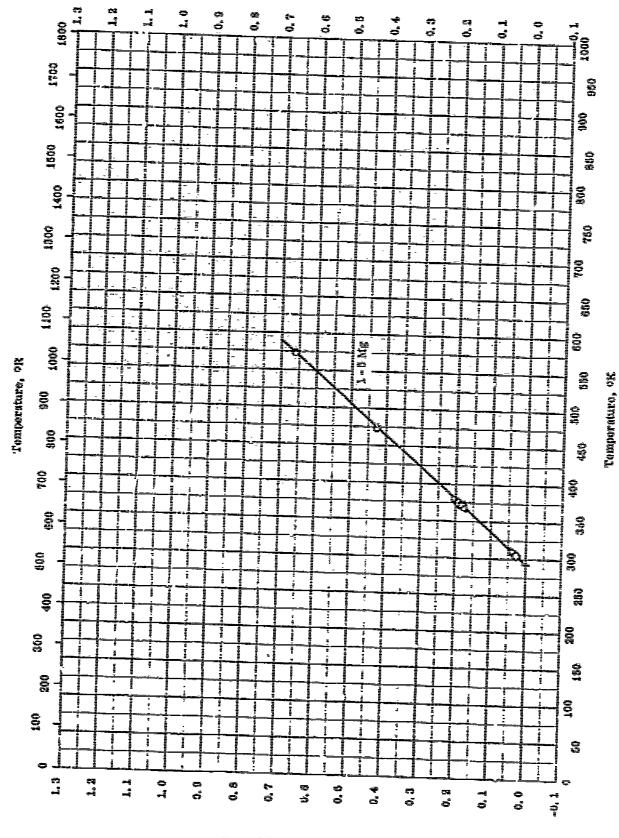
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thernal condictivity -- Alumnin + magnerium + 13%

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The state of the s	Karatya	Nelst 2 6 hrs at 360 400 C.		Section 25 and 2	Marketing and Applied William	Same as above,	Shine as above,								
***************************************	Hermon by the second	US. 3 Al. L. S. Mig. C. 3 Min; density 200 lb. ft. 3.	97. 2. A. I. B. B. Mig. 0. 3 Min; donsity low 16, 16, 18.	De. L. A.L. D. C. Mig. Consily for H. C	94.6 Al, SME, 0.4 Ming density Res ID Re".	Aydronalhan. BA (Cleximan design.); C. f., C. f., C. St. O. B. V. B. Mat nominal composition.	Hydronalium ? "rmun dasign,k 22. 5 Al, 7 Mg, 0. 5 Mn; wordinal composition.	RE LELD (British design); L. 30 Mg, L. 20 M, O. 60 St, O. 45 Zn,	0.44 Mtm, 0.30 Mt. Cu, Fo, 0.35 Co, 6.18 Cr, 0.18 Tr.						Whitelest transmission
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Thermal Linear Expansión, percent



Thermal Linear Expansion ... Accining a carregion a exp

Thermal Light Exparains, percen

Thermal Linear Expansion -- Aluminia amacinesium + Im

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THE THE PROPERTY OF THE PROPER	ительного полительного полительного применення предествення предестве	D4. C A3. C. V Ng. Ciril C. A Rin; clericity 100 Il Rel;	90, 3 Al. 3,0 ME, and 0,4 Mes. Leadly 169 W. 3.	97, 2 A., 2, 5 Mg, aml 0, 3 Mn; clonally 16, 16, 18, 1.	98.2 A1. 1.5 Mg, and 0.11 Mm; denesty 100 11 fc. 3.	Al Alloy Ille 13.1D (Trittish dessign.); 1, 10 Mg, 1, 20 M, 0, 50 St. Cust. Beld 10 hvs of 180 C 170 f.	0.46 2n, 0.44 Mr. 0.30 Cu, Fe ench, 0.36 Co, 0.18 Cr, and 0.18 Tl.						
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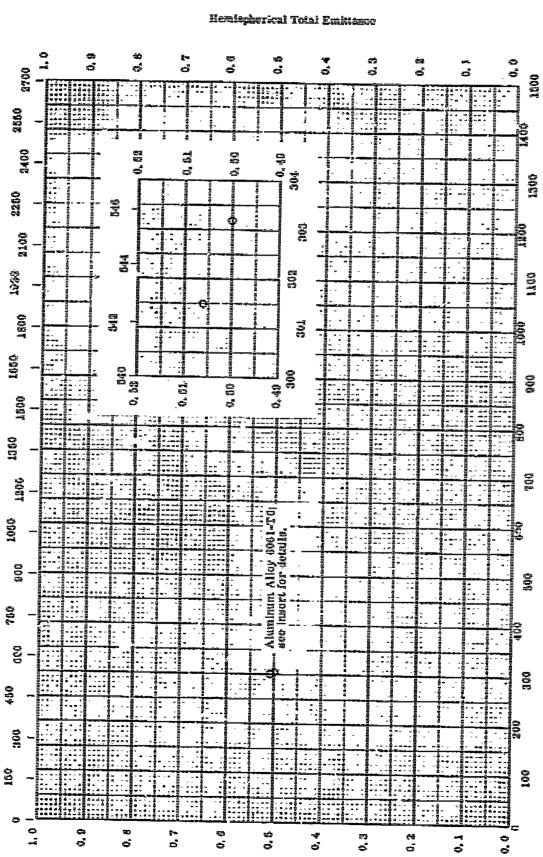
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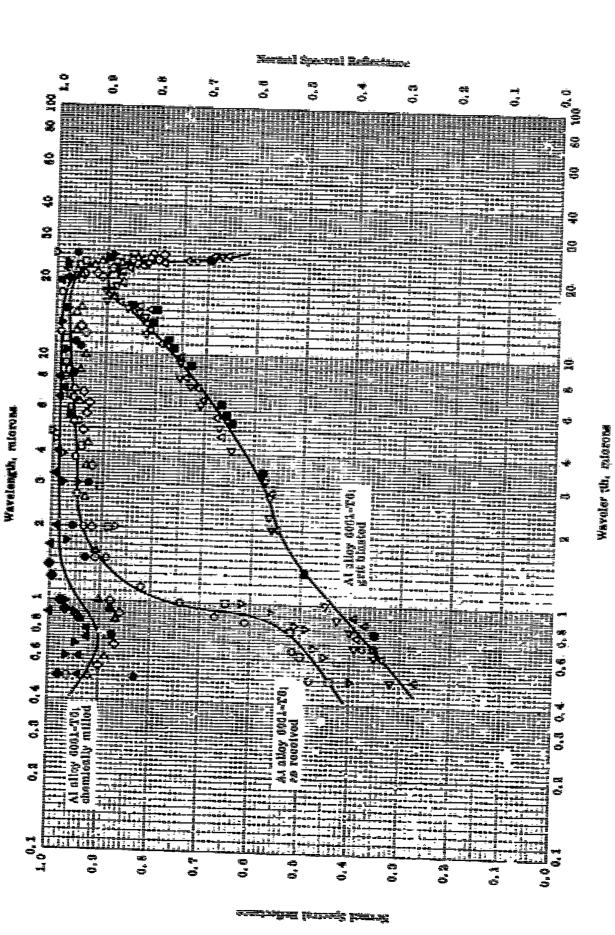
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рынургия польтиния приментинент приментинен	Alumination alloy docta. To no. 25 Ce, 0. 35 Zn, 0. 40 Cu, 0. 25 Ce, 0. 35 Zn, 0. 45 Ma, 0. 10. 14 Tl.
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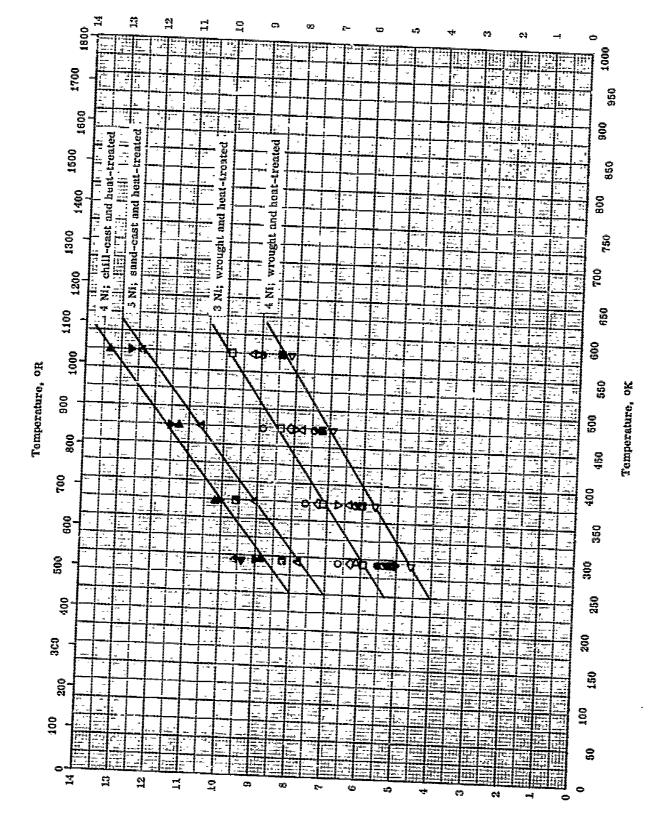
NORMAL SPECTRAL REFLECTANCE --- ALUMINUM +MAGNESIUM + Σ_{X_j}

REFERENCE INFORMATION

Taxa axa	As received.		Control of the Contro	de 10-8	X-ray exposure in a vacuum of 4x 10"	mm Hg for 24 hrs.	Chemically milled.	Chemically milled and grit blasted.	Chemically milled and exposed to a vacuum	of 4 x 10"8 mmllg for 24 brs.	Chemically milled and exposed to x-ray in a	vacuum of 4 x 10. * mm Ilg for 24 hrs.	Chemically polished,	Chemically polished and grit blasted.	Chemically polished and exposed to a	vacuum of 4 x 10"s mmilg for 24 hrs.	Chemically polished and exposed to x-ray	in a vacuum of 4×10-8 mm. Hg for 24 hrs.	
Sample Specifications	Aluminum alloy 6061.T6; nominal: 0,8-1,2 Mg, 0,40 -	0.8 Si, 0.7 Fe, 0.15-0.40 Cu, 0.15-0.35 Cr, 0.25 Zn, 0.15 Mn, and 0.15 Ti,	Aluminum alloy 6061T6.	Alominum alloy 6061T6.	Aluminum alloy 6661T6.		Aluminum alloy 6061T6.	Aluminum alloy 6061T6.	Alaminan alloy 6061–T6.		Ahunlaum alloy 6061-TS.		Aluminum alloy 6061T.6.	Aluminum alloy 6061-TG.	Aluminum alloy 6061-T6.		Aluminum alloy 6061T6,		
Rept.																			
Wavelength Range, u	0, 5-25, 0	 -	0, 5-25, 0	0, 5-25, 0	0, 5-25, 0		0, 5-25, 0	0, 5-25, 0	0, 50, 0		0, 5-25, 0		0, 5-25, 0	0, 5-25, 0	0. 5-25. 0		و. توریخ تاریخ	<u> </u>	
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ELECTRICAL RESISTIVITY -- ALUMINGM + NICKEL + EX



Electrical Resistivity, ohm cm x 10s

ELECTRICAL RESIST TTY -- ALUMINUM + NICKEL + EX

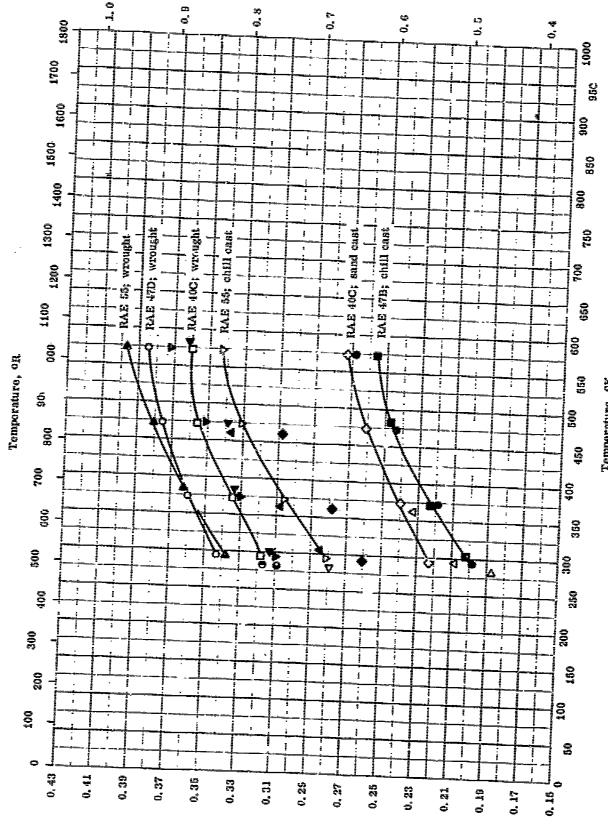
REFERENCE INFORMATION

<u> </u>	Sym	Ref.	Tame	1000		
L	3		Range ok	Error %	Sample Specifications	Not were to be
	o	492	203 473		Al Alloy RAE55 (British design.): 2, 90 No. 1, 20 Co., 1, 20 Co.	***************************************
					0.56 Mg, 0.43 Fu, 0.21 Sl, 0.15 Cr, and 0.07 Tl.	As received,
		2-8- 2-	292-673		Same as above.	4 hrs solution heat-treated at 570 c. battermanner
						quenched, held 12 hrs at 200 C, and air cooled;
						heat-treated at 300 C; values unreliable, segre-
	4	4 0 1	298-573		Sarra ne nivere	gation, blow holes in cast, cracks in forged,
					MARKET AND ANAGOVED	hrs solution heat-treafed at 570 C, boiling water
		-				quenched, held 12 "rs at 200 C, air cooled,
						heat-treated at 400 C; values unreliable, secre-
<u> </u>	<u></u>	4. 0. 5. 5.	202-472		A 1 A 11 and a 1 and a	gation, blow holes in east, cracks in forgett.
-					0.52 Mr. 0.40 M. 0.40	Wrought, as received; values unreliable, searre
Þ		40-2	20 20 20 20 20 20 20 20 20 20 20 20 20 2		Green and the case of the control of	gation, blow holes in east, cracks in forged.
					THE STRUCKS	Wrought, solution heat-treated 40 hrs at 570 C:
						boiling water quenched, aged 40 hrs at 160 C.
						cooled in air; values unreliable, segregation,
•	- -	2-64			A Hannes Was sentence from the contract of the	blow holes in east, cracks in forged.
_	_				0.40 Re 0 17 Cm 200 0 17 Cm 200 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	Wrought, as received; values unreliable, seare-
_	~	40-2	293		Carrie of the Ca	gation, blow holes in east, cracks in forged.
					Shinks to diverge.	Wrought, solution heat-treated 40 hrs at 570 C:
						boiling water quenched, aged 40 lars at 160 C.
						cooled in air; values unreliable, sourceration
	4				(Continued onto next unite)	blow holes in east, eracks in forced

TPRC

ELECTRICAL RESISTIVITY -- ALUMINUM + NICKEL + EX. (continued)

## ##	Ref.	Temp. Range ok	Rept. Error %	Sample Specifications	Remarks
4	64 64	293		Al Alloy RAE47B (British design.): 4.0 Ni, 3.07 Mn, 1.0 Cu, 0.5 each Mg, Fe, and 0.2 each Si, Ti.	Sond oast; as received.
>	4. 3.	293-673		Al Alloy RAE47B (British design.): 4. 0 Nf. 3. 07 Mn, 1. 0 Cu, 0. 5 each Mg; Fo, and 0. 2 cach Sl, Tl.	Sand cast; heat-treated.
٧	4 5 5	00 00 00 00		Same as above.	Chill cast; as received.
À	40-2	293-673		Sama as above.	Chill cast; heat-treated,
4	49.2	88		Al Alloy RAE47D (British dosign.): 4.0 Ni, 3,0 Mn, 1.0 Cu, 0.5 Mg, < 0.5 Fe, 0.4 Be, and 0.3 Si.	Wrought; as received.
▽	4. C.	508		Same as akave.	Wrought, heat-trented 6 hrs at 570 C, cold water quenched, aged 20 hrs at 160 C, and air cooled.
۵	40 2-0 2-0	8		Al Alloy RAE40C (British design.): 5.0 Ni, 3.07 Mn, 2.0 Cu, 0.5 each Mg, Cr, < 0.5 Fo, 0.4 Be, and 0.3 Sl.	Wrought, as received.
3	24 25 25	2002 2004 2004		Same as above.	Wrought, heat-treated 6 hrs at 570 3, cold water quenched, aged 20 hrs at 150 C, and air cooled.
8	40-2	203-373		Same as above.	Sand cast; as received.
4	# 64 64	293-673		Same as above.	Sand cast heat-tranted, 6 hrs at 570 C, cold water quenched, aged 20 hrs at 156 C, and air cooled.



Thermal Conductivity, cal Sec-1 cm-1 K-1

TPRC

Thermal conductivity -- Aluminum + Nickel + En

Western Companies and Compani

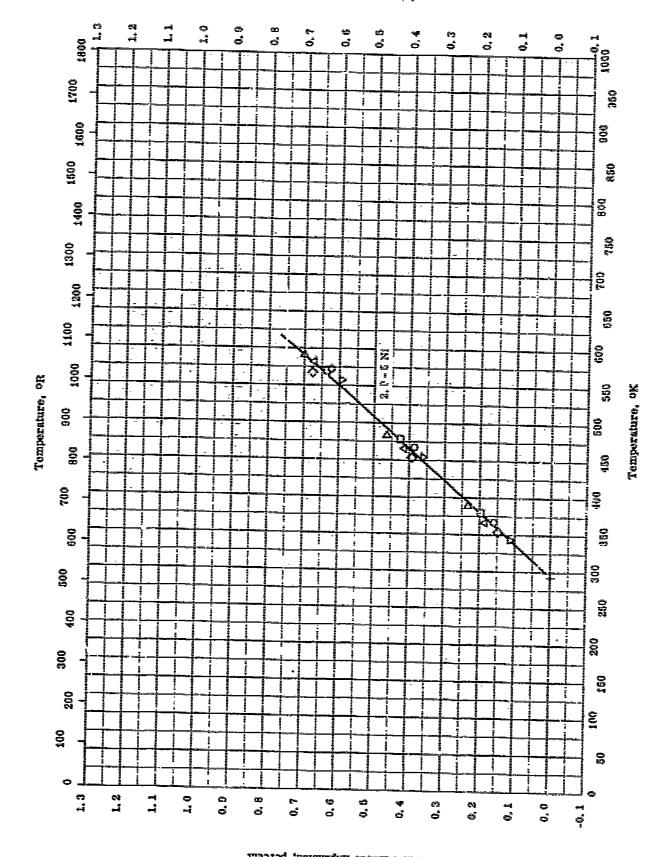
Thermal conductivity -- aleminen + nickel + ex

50t Range OK Evror% 49-2 203 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-673		The state of the s
49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-673	770 	der berend in e
49-2 293-573 49-2 293-373 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573	RAE 40C (British design.); 5.0 Ni, 3.0 Mn, 2.0 Cu, 0, 5 ca.	Wrought; 6 hrs at 570 C, cold water quenched.
49-2 293-373 49-2 293-373 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-473	Mg, Cr, 0, 6>Fo, 0, 4 Bo, 0, 3 St.	aged 20 hrs at 150 C, and air cooled.
49-2 293-373 49-2 293-573 49-2 293 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-673	Same as above.	Wrought; same as above with additional treatment
49-2 293-373 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-573 49-2 293-473		at 300 C and air cooled.
49-2 293 49-2 293 49-2 293 49-2 293-673 49-2 293-673 49-2 293-673	Sarne as above.	Sund cast; 6 hrs at 570 C, cold water quenched,
49-2 293 49-2 293 49-2 293-673 49-2 293-673 49-2 293-673 49-2 293-673		aged 20 hrs at 160 C, and air cooled.
49-2 293 49-2 293 49-2 293 49-2 293-673 49-2 293-673 49-2 293-673	Same as above.	Sand cast, same as chove with additional heat
49-2 293 49-2 293 49-2 293-673 49-2 293-673 49-2 293-673		treatment at 300 C and air cooled.
49-2 293 49-2 293 49-2 293-673 49-2 293-673 49-2 293-473	RAE 47D (BRILLS H dossgn.); 4. 0 NJ, 3. 0 Mn, 1. 0 Cu, 0. 5 Mg,	Wrought; 6 hrs at 670 C, cold water quenched.
49-2 203-673 49-2 293-673 49-2 293-673 49-2 293-473	C. 57 FG, C. 4 BG, C. 3 SL	aged 20 hrs at 150 C, and air cooled.
49-2 293-673 49-2 293-673 49-2 293-473	Same as above.	Wrought; same as above with additional treatment
49-2 293-673 49-2 293-673 49-2 293-473		at 300 C, and air cooled.
49-2 293-673 49-2 293-673	RAE 47B (British design.); 4.0 Ni, 3.0 Mn, 1.0 Cu, 0.5 an Mg, Fo, 0.2 an Si, Ti.	Sand cast.
49-2 293-673 49-2 293-473	Same as above.	Sand onst; heat treated at 300 C, and air ecoled.
49-2 293-473	Same as above.	Chill cast; beat treated at 300 C, and air cooled;
	RAE 55 (British design.); 2, 85 Ni, 2, 92 Mn, 1, 67 Cu, 9, 52 Mg.	Wrought; sclution heat treated 4 hrs at 870 C,
	0. 40 Cr. 0. 41 Fe, 0. 17 St, 0. 07 Tl.	quenched in balling water, aged 40 hrs at 160
		C, cooled in air; withes unveltable due to
		segregation, blow holes in cast, oracks in
	(Continued onto next page)	forgad.

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THERMAL CONDUCTIVITY --- ALIMINUM + NICKEL + EX. (continued)

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Nexarics	Wrought; same as above, with additional heat	treatment at 300 C, and air cooled.	verting the state of the vertical reservant section is the second	Same treatment as above except with additional beating at 300 C and air cooled.	Chill cust; solution heat treated 4 hrs at 570 C, quenched in boting water, aged 12 hrs at 200 C, air ccolet; values unreliable.	Chill cast; same as above with additional heat treatment at 300 C, and air cooled.	Chill cast; same as above except final heat treatment at 400 C.	
Sacifications	Samo ne abovo.	TAR 54 (Legislan dandam's a law to a law and a	0.17 Cr. 0.15 St.	RAE 55 (British desngn); 3.01 Ni, 1.68 Cu, 0.40 Mg, 0.40 Fo, 0.17 Cr, 0.15 Si.	RAE 66 (British design): 2.00 NI, 1.89 Cu, 1.55 Mn, 0.66 Mg, 0.43 Fe, 0.21 SI, 0.16 Cr, 0.07 Tr,	Same as above,	Svrne as abovo.	
Rept.						_		
Tomp. Range ok	200-22	898		203-673	303-473	253-673	202-273	
Rof.	4 0 1	69 69 77		4 9 6	4	2°0	81 64	
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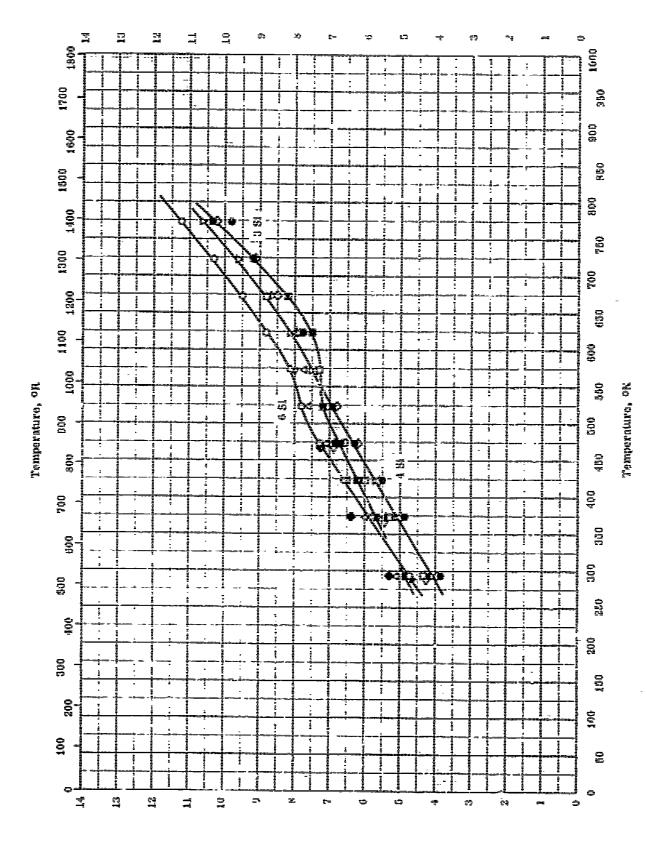
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Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- ALUMINIM + NICKEL + ΣX_1

REFERENCE INFORMATION

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$H_{C,T_{1},T_{1}}(\mathfrak{g})$	Pietest data show average for 2 samples (VIB) in	7, 29%);	(b) wrought, heat-treated 6 hrs at 570 C. cold	water quenched, 20 hre at 150 C, and air-cooled.	Pietted than show average for 2 earnples (within	1 (960 . 0	(u) Cast. (real-treated as above.	Wrought, values unreliable because of everts	the statement of the st	Cast; values unreliable because of segregation and blow holes.	Plotted data show avorage for 2 samples (within 12%);	(a) wrought. (b) wrought, heat-treated 6 hrm at 670 C, cold	water quenched, 20 hrs at 160 C, and air-cooled,	Cast: tested in mand east and chill cast condition.	
	_<	2.0 Cu, 0.5 Mg, Cr each, <0.5 Fe, 0.4 Be, and 0.3 St.			Samo ag above.			Aluminum Al. y RAB 53 (Brittsh deelgn.); 3, 05 M, 1, 08 Mr.	1, 68 Cu, 0, 60 Mg, 0, 45 Cr, 6, 39 Fe, 0, 19 Sl, and 9, 98 Tl.	Aluminum Alloy RAE 65 (British design.); 2, 50 M, 1, 89 Cu, 1, 55 Mn, 0, 56 Mg, 0, 43 Fe, 0, 21 St, 0, 15 Cr, and 0,07 Ti	Aluminum Alloy RAE 470 (British design.); 4.0 Mi, 11.0 Mn, 1.0 Cu, 0.5 Mg, <0.6 Fe, 0.4 Eq. and 6.3 Si.			Aluminum Alloy RAE 47B (British design.); 4,0 Nl. 3,0 Mn. 1,0 Cu, 0,5 Mg. Fe cach, und 0,2 St, 77 cach,	
Repr.															ves
Tong.	2911-573				## ## ## ## ## ## ## ## ## ## ## ## ##			202-573		290673	255-673			203-073	
1 lbsf.	£			,	4			# C		462	4			2. G	
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electrical resistivity --- aluminum + silicon + 12M, (2-6 51)

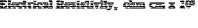
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	5	Ro.f.	Range of Error %	Kept.	филимительная потемприятичная потемпри	н финоненния петемента петемента петемента петемента петемента петемента петемента петемента петемента петемен
		18-1	201.77		ТРАТИМИХ В В В В В В В В В В В В В В В В В В В	Kerrangen mengangan mengan mengangan mengangan mengangan mengangan mengangan mengangan mengan
		•			u. 04 31, 1, 04 Cu, 0, 15 Fe, 0, 05 Zn, 0, 02 Tl, and traces of Mg and Ma.	Class, hold o has at 070 k and quonched in water.
<u> </u>			ron-era		0, 00 fst. 1, 03 Cu, 0, 10 Fe, 0, 05 Zn, 0, 02 Tt, and traces of	Same as above.
₫		######################################	203-623		4. 00 SH, 3. La Cu, 0. Lb Ya, 0. OB Zn, 0. OZ TK, und tracom of Mg and Mn.	game as abeve.
<u> </u>		# E = 1	203-773		3, 95 24, 1, 64 Cu, 0, 10 Fu, 0, 09 Zn, 0, 02 T1, and trauss of Mg and Mn.	Barne as above,
Þ		# # # # # # # # # # # # # # # # # # #	204-1-204		3.91.81, 3.03 Cu, 0.15 Fu, 0.08 Zn, 0.03 Ti, and traces of Mg and Mn.	Startin and Albowa,
•	-	# 	844		3.06 81, 1.04 Cu, 0.13 Fu, 0.05 Zn, 0.02 Tl, and tracos of Mg and Ms.	क्षेत्रमा व वाम वाक्रेड ५००
•	Ŧ		203-773		3. 06 81, 5. 08 Cu, 0. 15 Fe, 0. 05 Zn, 0. 02 Tl, and tracon of Mg and Mn.	Stanta and ashrova,
4	ਜ	4. 0. 2.	202-473	-	Aluminant attoy trudo (British dosdin.) i S. 28 M. 1. 40 Cm. J. 18 Po. o. 66 M. O. 19 Tl. and G. M. M.	Cast heated to has at too G and air geoles,
•	~	ei -	200		Same or above.	Pl and A
• ,	=	-	202-173		Atumfaum alloy Regge (Aratlan douger,): 3. 42 61, 1. 33 Cu. 1. 12 Po. 0. 67 Nt. 0. 40 Ng. and 0. 16 71.	Court,
∇	¥	4	201-204	3 .	Binarrady and takhora viola	
					МИМ ДЕЛЕГИИ В В В В В В В В В В В В В В В В В В	heatert 45 hre at 146 C.

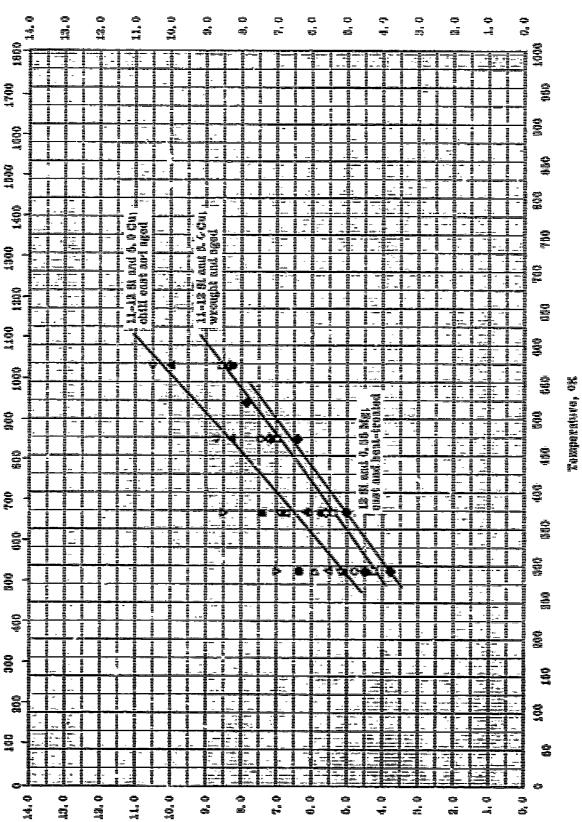


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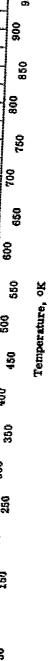
Electrical resistivity -- aluminum + silicon + $\Sigma x_{\rm I}$ (11-12 SI)

REFERENCE INFORMATION

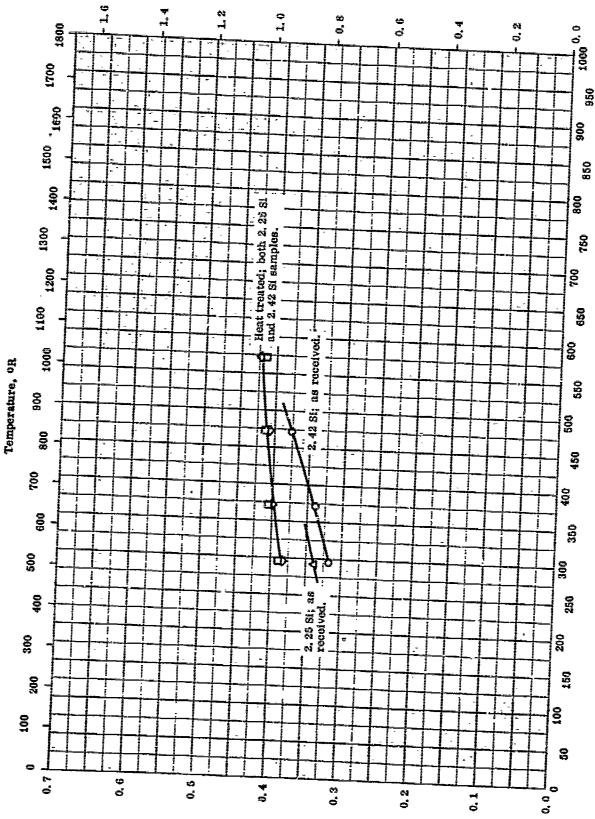
	Remarks	Wrought.	Wrought; heated 12 hrs at 520 C, quenched, aged	4 hrs at 135 C, ecoled in air, aged 4 hrs at 200 C, and then air cooled.	Wrought; a range of values of ± 4% for different summises.	Wronght; heated 3 hrs at 500 C, cold-water	quenched, aged 16 hrs at 165 C, and air cooled;	a range of values #4% for different samples.	Chill cust; a range of values #7% for different	samples.	Chill cast; heated 3 hrs at 500 C, cold-water	quenched, and aged 16 hrs at 165 C; a range of values ± 7% for different samples.	Wrought; a range of values ±7% for different	Samples.	quenched, aged 16 hrs at 165 C, and air cooled:	a range of values 1.7% for different samples.	Chill cast; a range of values ±7% for different	Andread and a control of the control
į	Sample Specifications	Al Alloy Lo-Ex (British design.): 11, 80 M, 1, 63 Cu, 1, 62 M, 0, 91 Mg, 0, 50 Fo, 0, 63 Mn, and 0, 62 Th.	Same as abovo.		Al Alloy nAE SA44 (Brittish dosign.): 11.0 Si, 5.0 Cu, 0.5 Mg, <0.5 Fe, 0.4 Mn, 0.3 Cc, and 0.1 Ti.	Same as above.			Same as above.		Same as above.		Al Alloy RAE SAI (British design.); 11.0 Si, 5.0 Cu, 0.6 Mg,	Same as above,			Sa'na as above.	
***************************************	Error%	,										-						
**************************************	Range CK	293-473	293-573		293-373	292-573		6	23.5-562		283-573		293-373	293-673	•		293-573	
Γ	Met.	4. 6.	492		4 0 1 2	492		0			ş. Si		4.00 2.2	48-2		9	N	
Sym	ğ	0	0		4	♦		0	> 	?	7		Δ	•		3		•

ELECTRICAL RESISTIVITY -- ALUMINUM + SILICON + ΣX_i (continued) (11-12 Si)

Remarks	Chill east; heated 3 hrs at 500 C, cold-water quenched, and aged 16 hrs at 165 C; a range of values #7% for different samples.	Cast, as received.	Cast; held 4 hrs at 515 C cold water quenched, held 16 hrs at 150-165 C.	
Sample Specifications	Same as above,	Al Alloy Alpax Gamma (British design.): 12.0 St. 0.35 Mg, 0.29 Mn, and 0.28 Fe.	Samo as above.	
Rept. Error %				
Temp. Range ok	293-373	293	293-573	
Ref.	2~2	4. 6. 6.	6-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0	
Syn	4	>	•	



THERMAL CONDUCTIVITY -- ALUMINUM + SILICON + Σx_1 (2-2.5 SI)

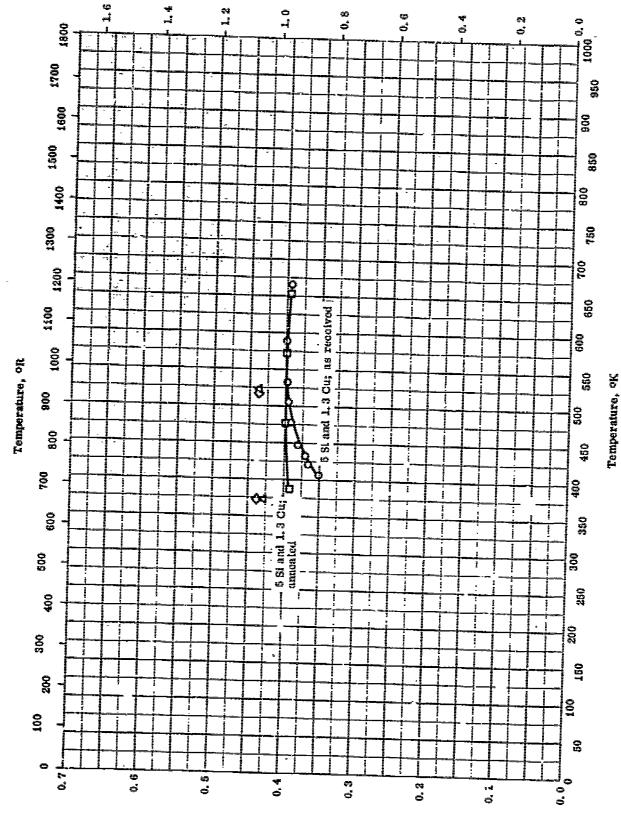


Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

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THERMAL CONDUCTIVITY -- ALUMINUM + SILICON + ΣX_1 (2 - 2. 5 Si)

Remarks	Cast, as received.	Cast; hold 2 hrs at 530 C, water qu mched, and then held 15 hrs at 165 C.	Cast, as recolved.	Cast; held 10 hrs at 165 C, and air cooled.	
Sample Specifications	Al Alloy RR63C (British design.); 2. 42 St. 1. 33 Cu, 1. 12 Fe, 0. 87 Ni, 0, 50 Mg, 0, 16 Tf.	Same as above.	Al Alloy RR50C (British design, 2.25 Si, 1.40 Cu, 1.18 Fe, 0.90 Ni, 0.19 Ti, 0.12 Mg.	Same as above.	
Rept. Error %		, <u>.</u> .			
Temp. Range ok		203-673	88 80 80 80 80 80 80 80 80 80 80 80 80 8	293-673	
Ref.	49-2	49-2	2 2	4 2-8	
Sym	0	0	٥	\rightarrow	



Thermal Conductivity, cal $Sec^{-1} \circ m^{-1} K^{-1}$

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Thermal conductivity -- aluminum + silicon + Σx_1 (5-6 si)

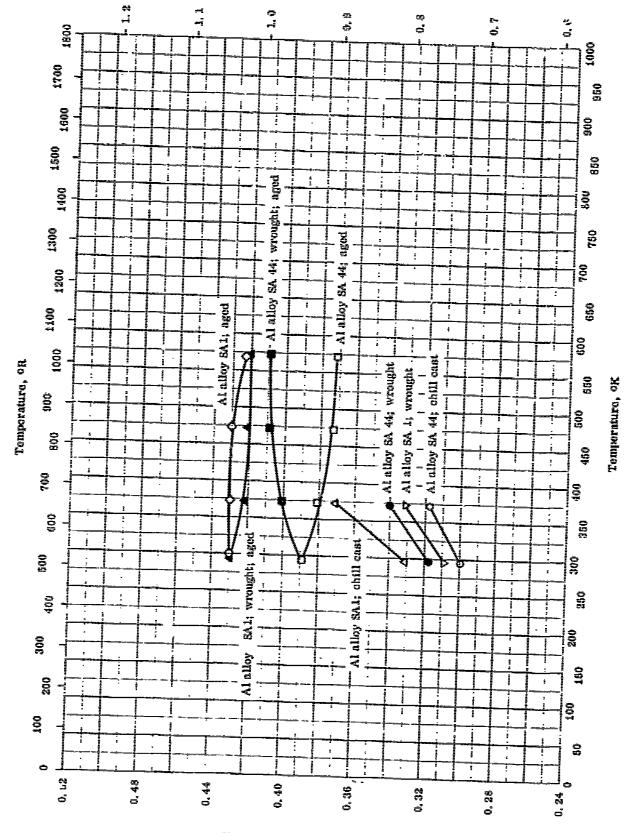
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THERMAL CONDUCTIVITY -- ALUMINUM + SILICON + ΣX_i (6-6 SI)

- 1				
Nexnarks	Bun 1; heated from vivgin conditions to max. temp. of 7.07 E.	After cooling to recan temp, and repeating.	Annealed for 1 hr at 500 C. 23 hrs at 400 C, and 40 hrs at 300 C.	Same as above.
Sample Specifications	5.0 Si, 1.3 Cu, 0.5 Mg.	Same as above.	91. 79 Al, 5. 5 St. 1. 43 Cu, 6. 42 Mg, 6. 41 Fe, 6. 27 Mn, 6. 14 Zn, 6. 64 Tl; heavily gassed.	Same as above; not gassed.
Rept.	ゼ #	#	eo #I	। स
Range ok	388-666	388-666	372-522	5.23~553
Ref.	C-10	61-3	51-4	4
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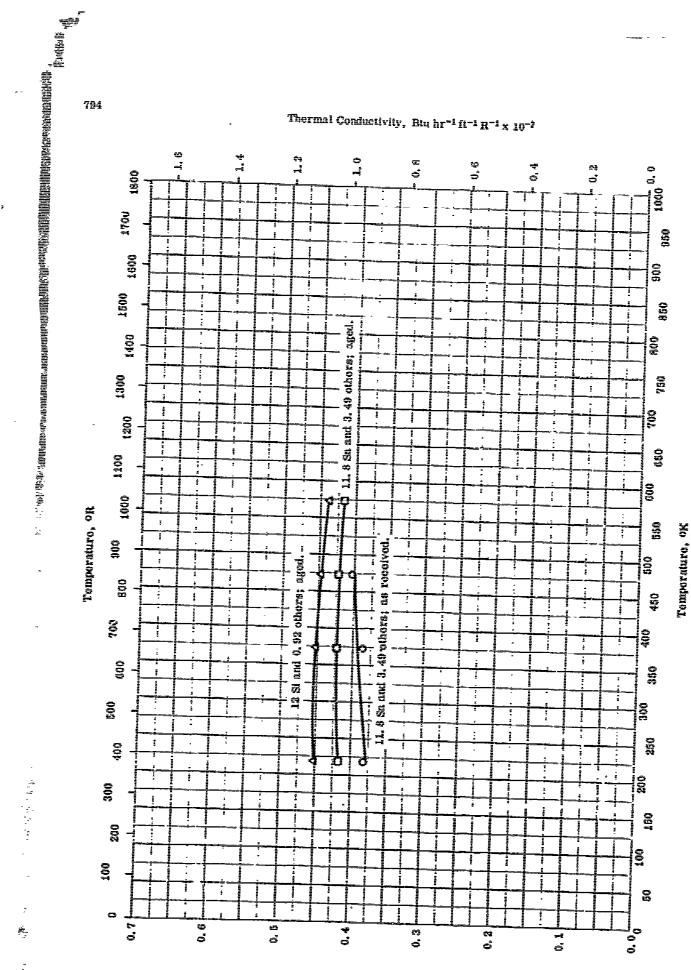
Thermal composity - aluminum + silicon + Σx_k

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

Billion of States

Thermal conductivity -- aluminum + silicon + Σx_1

E28	Rof.	Temp.	Rept.	Sample Specifications	Remarks
0	40-24-24-24-24-24-24-24-24-24-24-24-24-24-	293-373		Aluminum Alloy SA 44 (British dosign.); 0, 5 Mg, 0, 5>Fe, 0, 4 Mn, 0, 3 Co, 0, 1	Chill cast.
0	8 G	202-673		Samo as abovo.	Chill cast, heated 3 hrs at 500 C, cold water quenched and aged 40 hrs at 105 C.
•	4.0 6.0	293-373		Same as above.	Wrought.
	4 2-6	203-673		Same as above.	Wrought; heated 3 hrs at 495 C = 500 C, cold water quenched, aged 16 hrs at 165 C and att coaled.
d	19	203-273		Aluminum Alloy SA. I (British design.); 11, 0 SI, 5.0 Cu, 0.6 Mg, Fo < 0.5 0.2 Co, 0.05 Ti.	Gbill cast.
\$	4 0 6	202 203 203		Samo as above.	Chill cast; heated 3 hrs at 495 C = 500 C, cold water quenched, aged 10 hrs at 165 C.
Þ	왕 0 5	293		Same as above.	Wrought.
4	4 64	203-273		Sarra above.	Wreught; heated 3 hrs at 405 C = 609 C, uold water quenched, aged 17 hrs at 185 C, alr cooled.
<u> </u>					



Theomal conductivity -- aluminum + silicon + 2x[(11, 5-12 5))

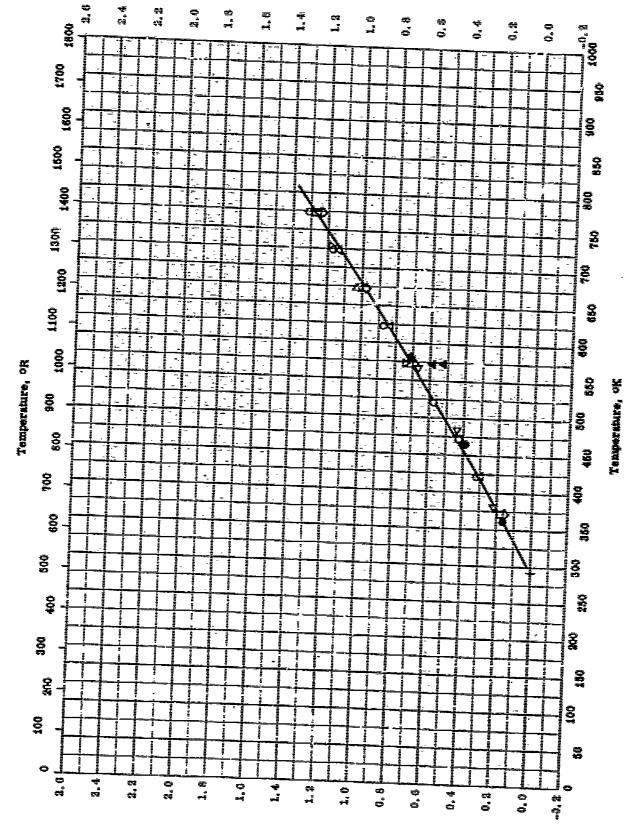
Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

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Thermal connuctivity -- a luminum + silkon + 2 m

Historia de la composició	Vrought, as recolved.	Wrought; hald 12 hrs at 520 C, quenched, aged 4 hrs at 135 C, ecoled in air, aged 4 hrs at 200 C, and then air cooled.	4 hrs at 510 – 18 C, water quenched, and then heated 16 hrs at 160 – 165 C.		
Sample Specifications	Alathoy ko-ex (British design.); 11, 50 St. 1, 03 Cu, 1, 02 Nf. 0, 91 Alg. 0, 50 Fe, 0, 63 Mn, 0, 02 Tr.	Same as above,	Aluminum Alloy. Alpax Carnma (British design.); 12. 0 Si, 0. 36 Mg, 0, 24 Mn, and 0, 28 Fe.		
Rept.					
Tong.	203473	203-673	2022 2022 2022 2022 2022 2022 2022 202		
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Thermal lingar expansion -- Alibarak + Giegon + Ex. (B- 6 Strot 1.- 4 Cu)

Thermal Linear Expansion, percent

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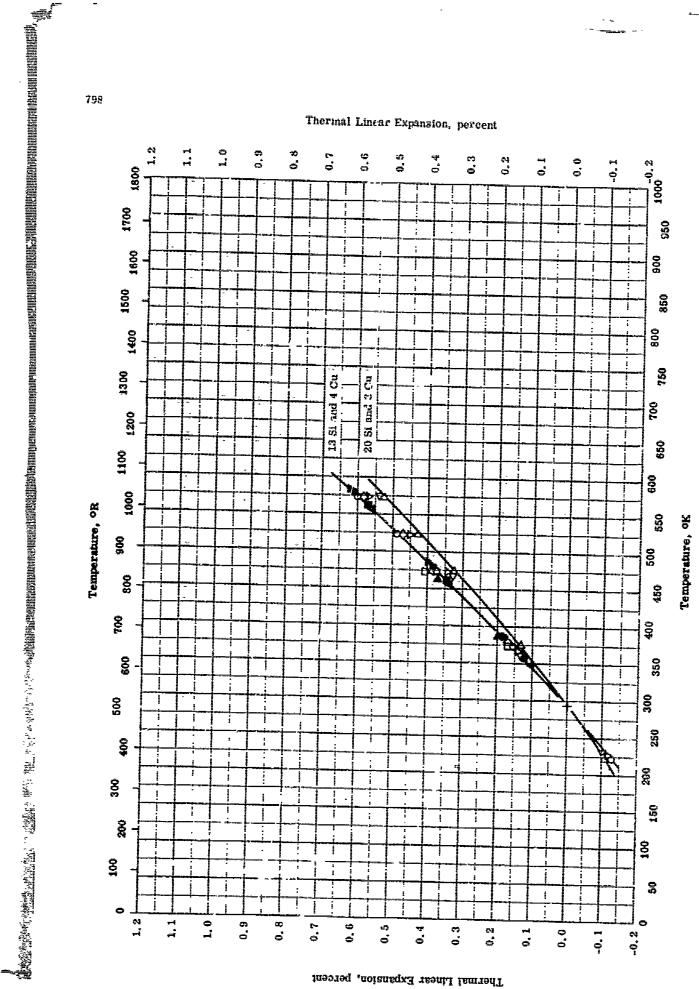
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поставительной располнительной выполнительной выпо	3.04 41, 1, 04 Cu, 6, 18 Fo, 0, 04 Zn, 0, 08 T1, and tencor of Ng and Ma.		O. DE BY, L. Of CH. D. LE Vos O. OB ZH, O. OB YH, AND UNKERS OF ME	6.00 Bl. L. OR Ch. O. IL Fo. O. OF En. O. OR Tr. Red traces of MR and bis.	o.od 81, 1.00 Cu. o.x0 Pe. O.06 Zu. o.01 Ti. and teacan of Ity	a.oo sh. n.ob tin. o. 16 Te. o. ob Kn. o. on Rt. and transm of Mg.	4.0 fff. 3. 1.6 ffue o. 1.6 ffo. 0.08 ffm. 0.06 fff. and knuode tell light and like.	ALALloy RRIBE? (Bright doelgo.) 1 - 44 66, 1. 63 Cm. 1. 13 Yo. O. 57 YR. O. 60 Alg. and U. 15 YD.	Alakay ingo da inggan gangarip. Bandar, bangarikan bangarikan da bangarikan bankan bankan bankarikan bankarika	Al Alkayri In I 1884, A 17th, Later West IV, Min whaten
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THEEMAL LINEAR EXPANSION -- ALUMINUM + SILICON + Σ_{X_1} (10-21 St and 1-10 Cu)

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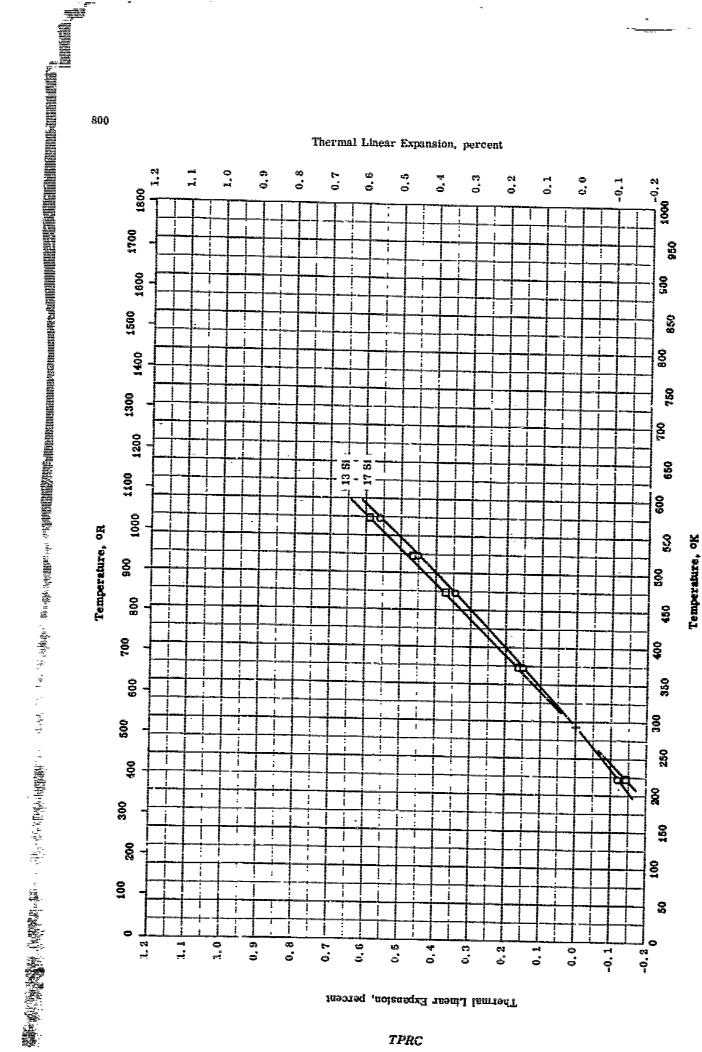
menomental properties and the contract of the

THERMAL LINEAR EXPANSION -- ALUMINUM +SILICON + ΣX_{\parallel} (10-21 St and 1-10 Cu)

Same as above. Al Alloy RAE SA 44 (British design.); 11.0 Si, 5.0 Cu, 0. <0.5 Fe, 0.4 Mn, 0.3 Co, and 0.1 Tl. Same as above. Al Alloy Lo-Ex (British design.); 11.80 Si, 1.03 Cu, 1.02 Ni, 0.91 Mg, 0.50 Fu, 0.03 Mn, 0.02 Tl.		373573 373573
6 -	NK, C	

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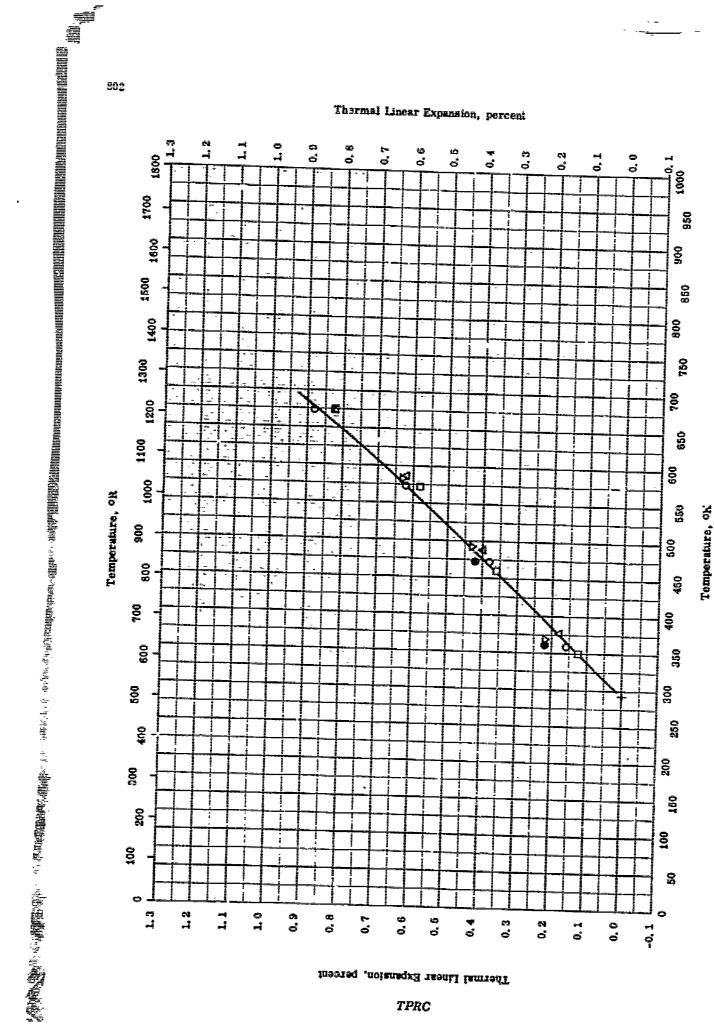
THERMAL LINEAR EXPANSION -- ALUMINUM + SILICON + Σx_i (13 - 18 SI and 0.7 - 1.0 Fc)



Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- ALUMINUM + SILICON + ΣX_1 (13-18 Si and 0, 7-1, 0 Fc)

Romarks	Normalized I hr at 400 C and cooled slowly.	Same as above.								
Sample Specifications	81. 80 Al, 17. 27 Si, 0, 81 Fe, and 0, 12 Cu.	86, 01 A1, 13, 08 St, 0, 76 Fe, and 0, 15 Cu.								
Rept. Error %								 		
Temp. Range ok	223-573	220-021	 		 ·		 	 	 	
Ref.	52-19	52-19				 	 		_	
Sym	0	П								



Thermal Linear Expansion, percent

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Thermal linear expansion -- aluminum + silicon + $\Sigma \kappa_i$ (12 Si and 0.3 - 1.3 Mg)

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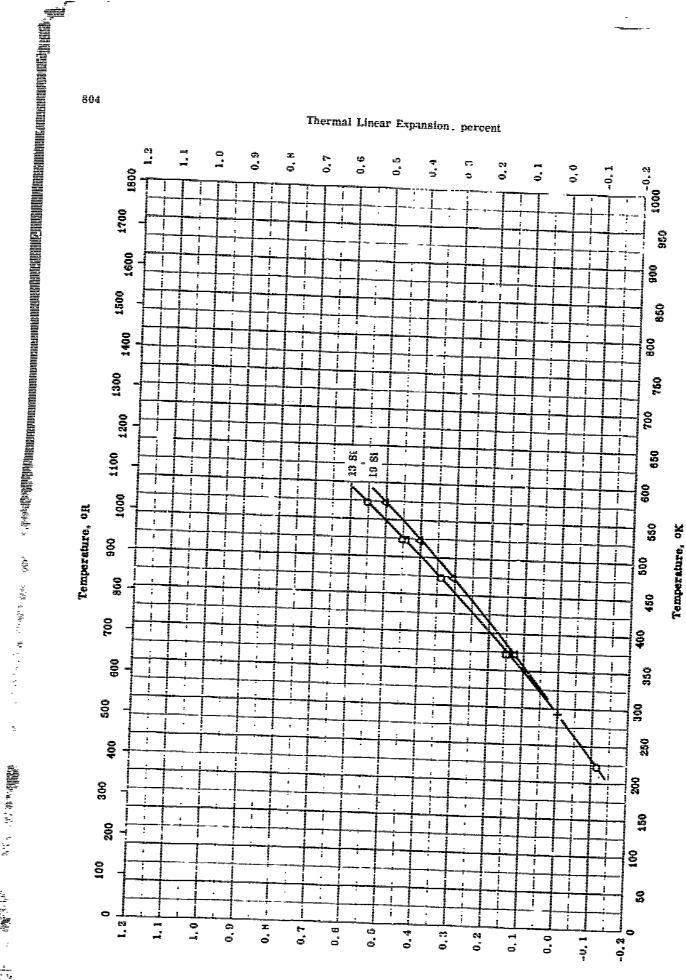
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THERMAL LINEAR EXPANSION -- ALUMINUM + SILICON + ΣX_1 (12 St and 0.3-1.2 Mg)

Hemarks	Solution heat treated 1 hr at 900 F, water quenched	and agent in 340 P.; heating.	Cooling.	Same as above; then aged 100 hrs at 700 F; heating	and cooling curves graphically identical.	Same as above; but aged 500 hrs at 800 F; heating	and cooling curves graphically identical.	Cast, heated 4 hrs at 510-518 C, cold water	quenches, and heated 16 hrs at 160-166 C.										É	
Sarble Specifications	84. 40 Al, 12, 18 Sl, 1, 20 Mg, 0, 89 Cu, 0, 87 NJ, 0, 41 Fe, 0, 02 Zn, 0, 01 Mn, 0, 01 Cr, and 0 of the		Same as above.	Same as above.		Same as above.			NATH, URMA O. 233 F.C.											
Error %				 -		-	-									•	 			
Ranga ok	203673	0000	Z73-672	293-673		293-673		200-000						-					*	-
***************************************	62-10	Ç	20	62-10		- 53-75 - 53		4 5 1	-			<u> </u>	_		-			· · <u>-</u>		
g g	0	_	-	0	•			—— ⊳		-	 _						 			_

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Thermal linear expansion -- aluminum + silicon + $\mathbf{E}\mathbf{x_i}$ (12-20 Si and 4-5 Ni)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- ALUMINUM + STLICON + ΣX_k (12 - 20 St and 4 - 5 Nt)

REFERENCE INFORMATION

The state of the s	Remainment	Normalized I hr at 400 C, cooled slowly.	Same as above,	Same as above.							_		
PROTECTION MICHAEL		Norma	Same a	Same a		_	 						
новинания применения применения применения применения применения применения применения применения применения п	umment-communicamentamentamentamentamentamentamentament	77. 83 Al, 13. 22 St, 4. 12 Nt, 4. 05 Cu, and 0. 78 Fo.	76, 59 Al, 12, 68 8l, 4, 44 Ni, 4, 13 Cu, 1, 36 Mu, and 80 Fe,	71,40 AJ, 10,30 SI, 4, 18 Nf, 3,14 Cu, 1,08 Mn, and 0, 84 Fc,									
T. Rept.	Error %					-	-		 •			-	
dual."	1	220673	25 CO	203-673						-			THE CONTRACT OF THE PROPERTY O
Lef.		C 10	G	6519	-	<u>-</u>						-	
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REPORTED VALUES

Dens	ity:	g cm ⁻³	lb ft ⁻²
0	Alloy 7075_T6 L'A Z5G	2,80 <u>1</u> 2,80	174.9 175
	ing Point: L'A 25G	K 873	R 1572
	of Fusion;	cal g ⁻¹	Hiu lb ⁻¹
₹	L'A 25G	93	167

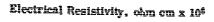
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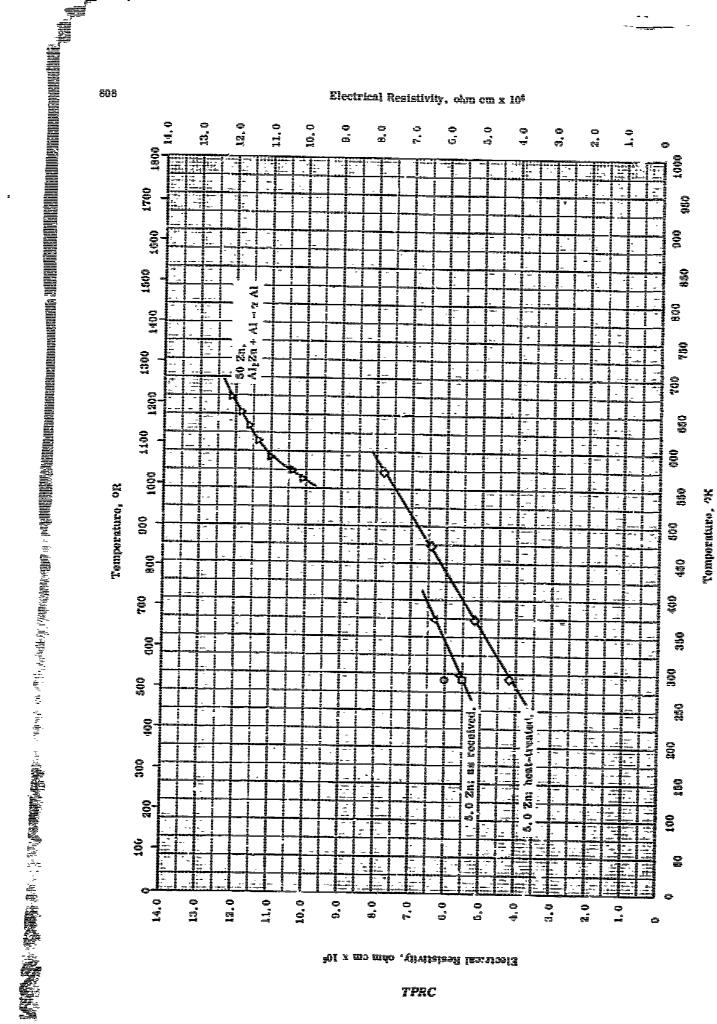
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PROPERTIES OF ALUMINUM + ZING $+\Sigma X_{\parallel}$

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	Rof.	Tomp.	itopt. Error %	Shan ple Specifications	Сителительности полительности полительности полительности полительности полительности полительности полительнос
	1-80			Alloy 7076-T6; E.6 Zn, 2.6 Mg, 1.6 Cu, and 0.3 Cr; nominal composition.	Herariks Donestry by wolght and volume by water displacement
	865	298		French alloy L'A. ZGG; 4.6 5.5 Zn, 0.40.65 Mg, 0.150.35 each Cu and Cr, 0.15.0.25 Tl, 0.8 > Fo, 0.4 > Mn, 0.3 > Sl and 0.05 > Nt.	Casting alley; fully aged.
	50-5 5-5	1672		Same as above.	Sheway no or comment
	99e	4572		Same as shove.	Same as above.
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			-		
					
1	-	-			







Electrical Resistivity, ohm cm z 10⁶

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BLECTHOAL BESIEFFVIY ... ALAMINIM + ZING + 232

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низинавипиского фінави: Виннечення попиского				480 C. 41 kb/ C.	15. Kook of the Tank in
у сонклинительству у принципальный приметальный приметальный приметальный приметальный приметальный приметальн ХТО ХКАК 4,9 «Констина стана полительный приметальный приметальный составлений приметальный составлений приметальный состав	Paully ageoet.	Normalized at led C.	Wrendght, marked there.	Wrongfit, molution has treated it bra at 400 C. gamenched in water at 70 C. aged 4 hra at 120 C. and air order.	Makard, parthank, when denawn, herbeard, definan
тельный при	A. Zuckley k. A. ZbC nombak 4.8 - 0.6 Zn, 0,6 p Fe. 0.4 - 0.08 Akr. 6.4 > An, 0,48 - 0.38 cack Cu, Cr, 0,9 > 44; 0.16 - 0.88 Yrand 0.08 > Ni densky rrb to fe.3.	Harng her taleave.	Alaboy Hit?? (British designation); 4.04 Zr., 4.64 Big. 3.30 Cr. 0.44 Mi. 0.03 Fr. 0.30 Mand terce of T.	ABCATALLO BASO VARO	46. 9 201 made troum Al with 0, 992 Mp. 65. Mg. Cd. 23 with 0, 993 made the Cd.
Errar A					
Renal Sk	nos	326	267-136	30%-479	50 - 11 - 11 - 11 - 11 - 11 - 11 - 11 -
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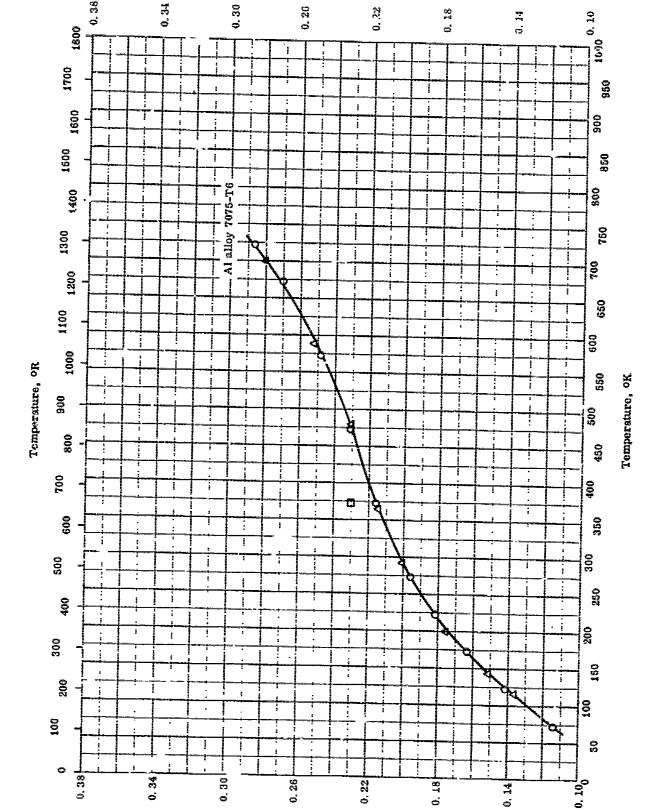
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SPECIFIC HEAT -- ALUMINUM + ZINC + ΣX_i

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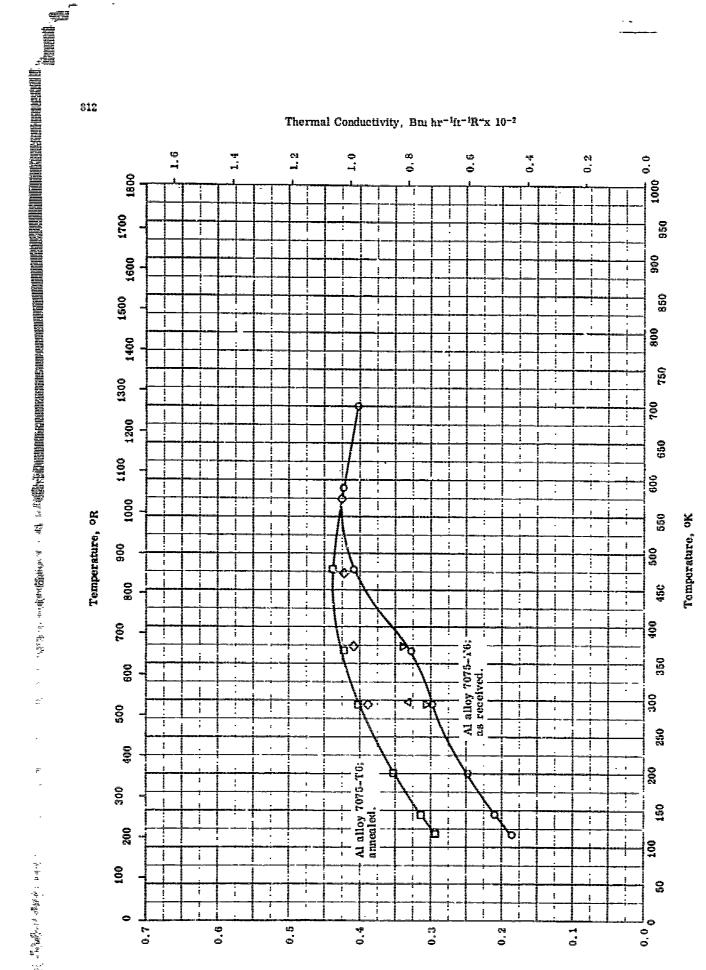
Specific Heat, cal g"! K":

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Specific heat -- aluminum + zinc + Σx_1

						 -	
Remarks		Fully aged.	Scaled under holium atmosphero.				
Sumple Specifications	Ai alloy 75 S - T 6; 90 Al, 5,5 Zn, 2,5 Mg, 1,5 Cu, 0,3 Cr and 0,2 Mn.	Alloy L'A - Z 56 (French design); 4.5 - 5.5 Zn, 0.4 - 0.65 Mg, 0.15 - 0.35 each Cu, Cr, 0.15 - 0.25 Tl, < 0.8 Fe, < 0.4 Mn, and < 0.3 Si; density 175 lb K ⁻³ .	Al alloy 7075 - T 6; nominal composition; 90.2 Al, 5.5 Zn, 2.5 Mg, 1.5 Cu, and 0.3 Cr.				
Rept. Error%					 		
Temp. Range ok		87.8 E	116-700				
Ref.	54-13	565	58-1				
Sym	0	0	٥				

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Thermal Conductivity, cal Sec-1cm-1K-1

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THERMAL CONDUCTIVITY -- ALUMINUM + ZINC + TX,

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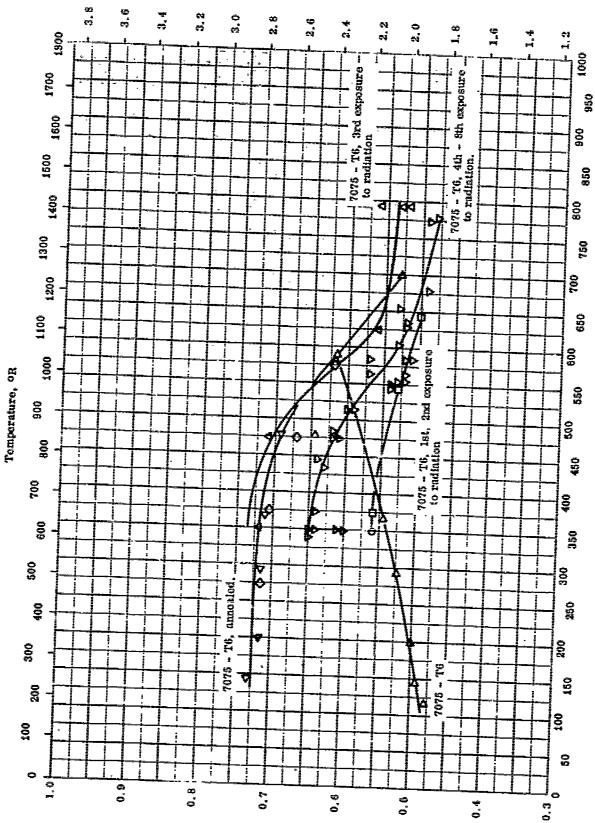
THERMAL CONDUCTIVITY -- A LUMINUM + ZING + XX,

REFERENCE INFORMATION

Remarks	As recoived.	After heating above 575 F.	Fully agod.	Solution hear treated 2 hrs at 450 C, quenched in water at 70 C, aged 4 hrs at 135 C, and aircouled.	As ruceived.	
Sample Specifications	7075 - T6 (Alcon); 5.6 Zn, 2.5 Mg, 1.6 Cu, 0.3 Cr; density 175 Hz (t-3.	Samo as alwore.	Alloy L'A-Z5G (French design.): 4.5-5.5 Zn, 0.4-0.65 Mg, 0.15-0.35 cu. Cu. Gr, 0.15-0.25 Tl, 0.8>Fe, 0.4>Mn, 0.3>Sl, 0.05>Mi, density 175 lb ft ⁻³ .	Wrought alloy RR77 (British design); 4. 96 Zn, 2. 54 Mg, 2. 20 Cu, Solution hear treated 2 hrs at 450 C, quenched in 0.54 Mn, 0.31 Fo, 0.26 Si, trace Ti.	Same as above.	
Rept. Error %						
Temp. Range og		117-700	80 80 80 80 80 80 80 80 80 80 80 80 80 8	293-573	201-673	
ltef,	T-89	28-1		452	4 0 6	
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Thermal diffusivity -- aluminum +zinc + Σx_i

Temperature, oK

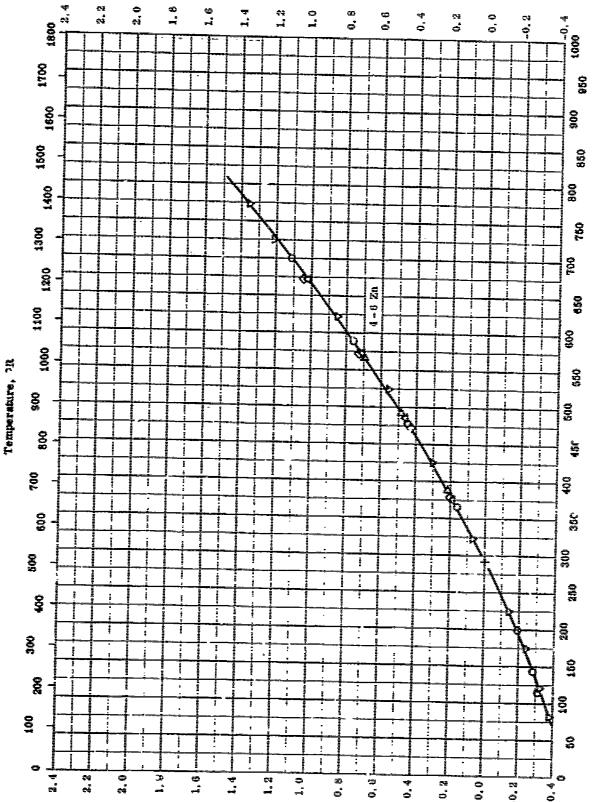
Thermal diffusivity, cm² Sec-1

THERMAL DIFFUSIVITY --- ALUMINUM + ZINC + EX

E S	Ref.	Tomp.	Rept.	Sample Specifications	Remarks
0	# # #0	848 8		7075-T6; 5.1-6.1 Zn. 2.1-2.9 Mg. 1.2-2.0 Cu, 0.7 Fe, 0.5 Si, 0.18-0.40 Cr, 0.30 Mn, 0.2 Tl, and 0.05 max each and 0.15 max others; composition from Handbook. (Author design: 2)	Mensured after exposure to radiation and followed by cooling.
0	67-1	373643		Same as abor e	Measured after another exposure to radiation and followed by cooling.
٩	57-1	248-793		Same as above	Monsured after the third cycle of exposure.
D	57 I	338-778		Same as above	Averaged values on measurements after from fourth to oighth exposure cycles.
Δ	581	116-700		7078-76; 5.4 Zn, 2.5 Mg. and 1.6 Cu.	As received,
₹	S8-1	144-700		Same as abovo	The above sample heated above 302 C.
0	561	273-673		768; 5.6 Zn, 2.6 Mg. 1.5 Cu, 0.3 Cr, and 0.20 Mn,	Annealed at 450 C.
				,	

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Thermal Linear Expansion, percent



THERMAL LINEAR EXPANSION --- ALUMINUM + ZINC + EX,

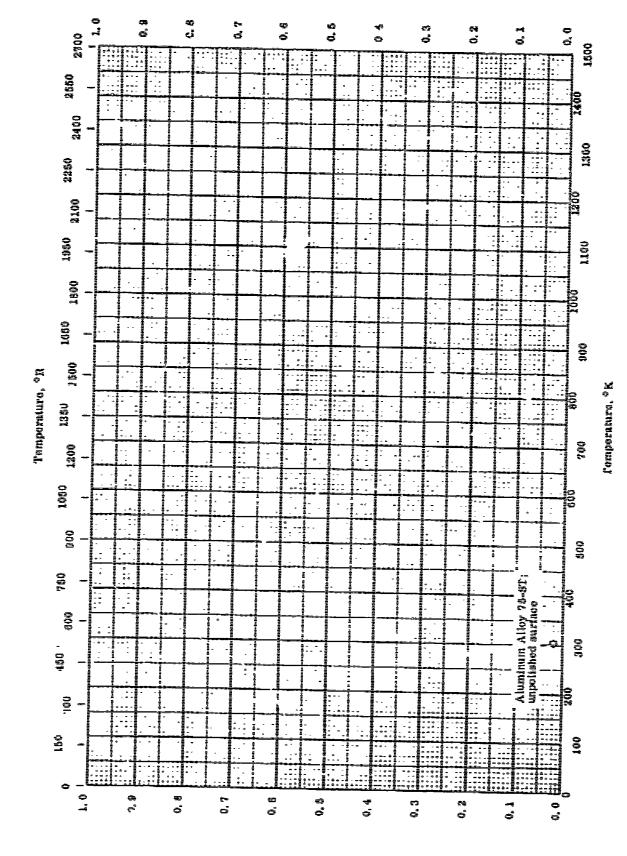
Temperature, or

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Thermal length expansion --- aluminum + zinc + ΣX_1

REFERENCE INFORMATION

Henrichten					င် ကို ကို ကို
ининения при	Tested in vacuum.	Cast; fully aged,	Cast: normalized at 180 C.	Tested at L.5 - 2.5 C min" rise in argon.	Miloy HR77 (British dealgn.): 99 Zn. 2. 54 Mg. 2. 20 Cu. 0. 64 Wrought, 2 hrs solution heat treatment at 450 C. Mn. 0.31 Fc. 0.26 Sl. and trace Ti. and afr-cooled.
	. 9 Mg.	Mg. 4 > Ma.			12, O, 64
ontionamentamentamentamentamentamentamentamen	Alloy 7076-TG (Alcou); vorminal: 5,1 - 6,1 Zn, 2,1 - 2,9 Mg, 1,2 - 2,0 Cu, 0,7 Fe, and 0,5 Sl,	Alloy No. 1. A.Z6G; nominal: 4.6 - 5.6 Zn, 0.4 - 0.65 Mg. 0.15 - 0.35 cach Cu, Cr, 0.15 - 0.25 Tl, 0.8 > Fe, 0.4 > Mn. 0.3 > St, and 0.05 > Mi, density 175 lb ft.?.		Al Alloy 768-T6; 5,6 2n, 2.6 Mg. 1.6 Cu, and 0.3 Cr; density 176 16 ft ⁻³ .	합 합
160114	. 0. 1 &n.	. 6 Zn, 0, 8		Cu, and	. 6. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.
Sample Specifications	nil: 4, 1	4.6.5 15.0.26 thy 176 [Mg. 1.0	86 %n uco TY.
Sample); examta	romtant: . Cr. 0. M; den		22, 2, 6	i. and ta
	'O (Mean 34, 0,7 F	A26G; cach Cu ni 0, 03 *	·0/	-T6; B, 6	c, 0,26 t
	Alloy 7075-Td (Alcon); mominal; 5 1.2 - 2,0 Cu, 0,7 Fe, and 0.5 Si,	Lloy No. 1. A.Z5G; nominal: 4.6 . 5.6 Zn 0. 13 . 0.35 cach Cu, Cr, 0. 15 . 0.25 T1, C 0.3 > St, nrd 0.05 > M; density 176 lb ft?,	Samo an above.	l Alloy 768- 176 lb ft ⁻³ .	Noy RRT7 (Liritish dealgn.); 96 Z. Mn, 0, 31 Fe, 0, 26 El, and trace Ti,
1 1	- Y	ALIK 0.			NIK
Erns %					
Ikung ok	117 700	203-073	860-108	62-3	373-673
#cf.	T 80	9-09	2-09	9-1-6 9-1-6	2
# Se	0	4	\$	Þ	Δ



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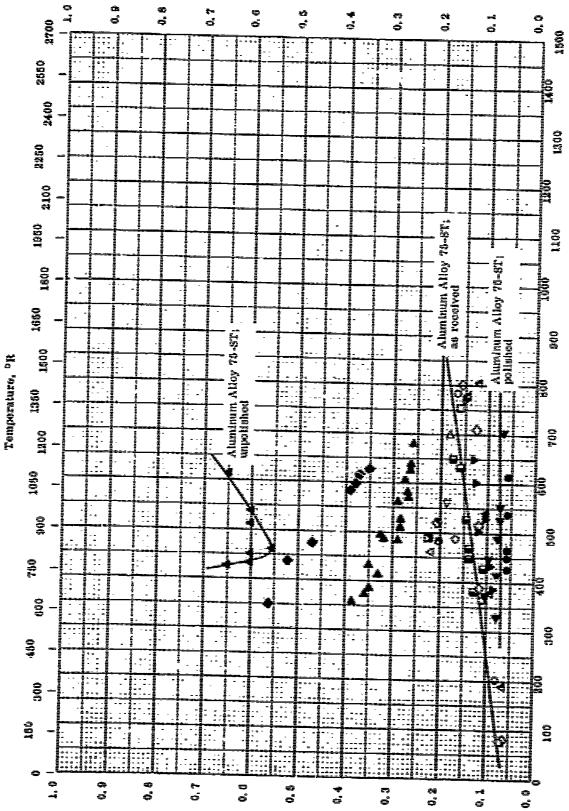
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Henisphenical Total Emittanor -- Aluminum + Zinc + Enj

Koroari	Unpolethed surface; measured in air.
Ref. Terre. Rape Special Control Contr	0.7 Fo, 0.5 Si, 0.18 - 0.4 Cr, 0.3 Mn, and 0.2 Ti.
Rept.	
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NORMAL TOTAL EMPTANCE ALUMINUM + 21NC + 238,



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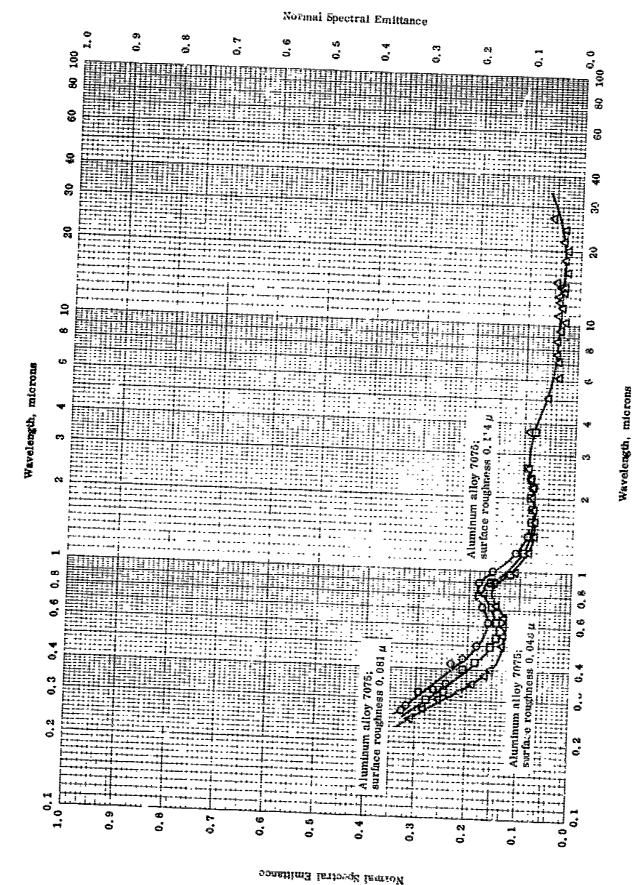
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Ò	\$0 60	78.783	76-3T. Aloladi mantank composition 6. 1 - 3. 1 - 3. D. M. D. M. Ferschvedt whych were in the hollown 1. 3 - 3. C. C., 0. 7 Fe. 6. 6 66, 6. 1. 5 - 6. 4 C. F., 6. 3 Mr. and (1.0 microre); cycke I hending.	As recolved wascely granuared in holium (LO macrorol) cycle I houting.
4	77-00 00	101	Charace an alberte.	Cycle R couling.
O	55-35	456	Characa ad altowar	Cyrke it heating.
Þ	\$C00	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Baing ha habova,	Cyche il esching.
O	\$6~34	000-09	78-9%, Aloind, nominal composition 6. L. O. L. Zir, 2. L. J. B. Mr. Washed and wiped; managed in beliam 1. J. J. J. O.Cu, 0. 7 Pe. 0. 8 81, 0. L9 - 0. 4 Cr. 0. 3 Mr. and 0. 3 Tr. (Lo microns) ayolo 1 housing.	Washed and wheel managarul in helium (Ao mkerum) ayolo A heating.
Ā	00-0-1	1,00	धिकामस्य व्यक्त व्यक्तिकरूकः	Cycle 1, escollege
Ā	-8-00	700	 Morered flad that wer.	Cycle & heatings
•	5 6-20	## ## ## ## ## ## ## ## ## ## ## ## ##	 Bearing the librator	Cyote a coolby.
4	1 6-96	3) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Therry, Arbitals marrianal compositions B. A. ch. k Ru, R. A. ch. k Ru, R. A. ch. k Ru, R. A. ch. ch. ch. ch. ch. ch. ch. ch. ch. ch	Fellshort to a intervertible finish and washed, oversoured in holding (10 microns); cycle 1. hwating,
#	\$C-00	\$ 55	 Bransta and asheeven,	Chuke a caolings
Þ	\$6-3¢	56.6	 Dame an above	Cycle a heatist.
•	\$2°-00	220	 Marayo can califorwas.	Cyole 2 useding.
			 (Confidence ento post page)	

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NORMAL TOTA!, EMITTANCE -- ALUMINUM + ZINC + EX1 (continued)

REFERENCE INFORMATION

Remarks	Polished; use polished flat shield during measure- ment.	Polished; use polished flat shield during neusure- ment.	Polished; use conical shiold during measurement.	Un, "olished.	Polished with Aerobright and BonAmi.	The above specimen, data taken on different days.	Anodized,	
Sample Spreifications	75-ST, Alclad; nominal composition: 5, 1-6, 1 Zn, 2, 1-2, 9 Mg. Polished; use polished flat shield during measure-1, 2-2, 0 Cu, 0, 7 Fo, 0, 5 Si, 0, 18-0, 4 Cr, 0, 3 Mn and ment.	75-ST, A'.:lad; nominal composition: 5.1-6.1 Zn, 2.1-2.9 Mg. Polished; use polished flat shield during menters. 1.2-2.0 Cu, 0.7 Fo, 0.5 N, 0.18-0.4 Cr. 0.3 Mn and ment. 0.2 Ti.	75-ST, Alclad; nominal composition: 5.1-6.1 Zn, 2.1-2.9 Mg, Polished; use conical shiold during measurement. 2.2-2.0 Cu, 0.7 Fe, 0.5 Sl, 0.18-0.4 Cr, 0.3 Mn and 0.2 Tl.	75-Sr, Alclad.	75-ST, Alclad.	75-ST, Alclad.	75-ST, Alclad.	
Rept. Error%								
Temp. Range ^o K	373705	3.28678	428-616	428-619	383-650	386-650	353628	
Ref.	54-27	54-27	51-27	54-27	54-27	54-27	54-27	
Sym	F	<u> </u>	•	4	_ Q	>	*	



NORMAL SPECTRAL EMITTANCE -- ALUMINUM + ZINC + EX,

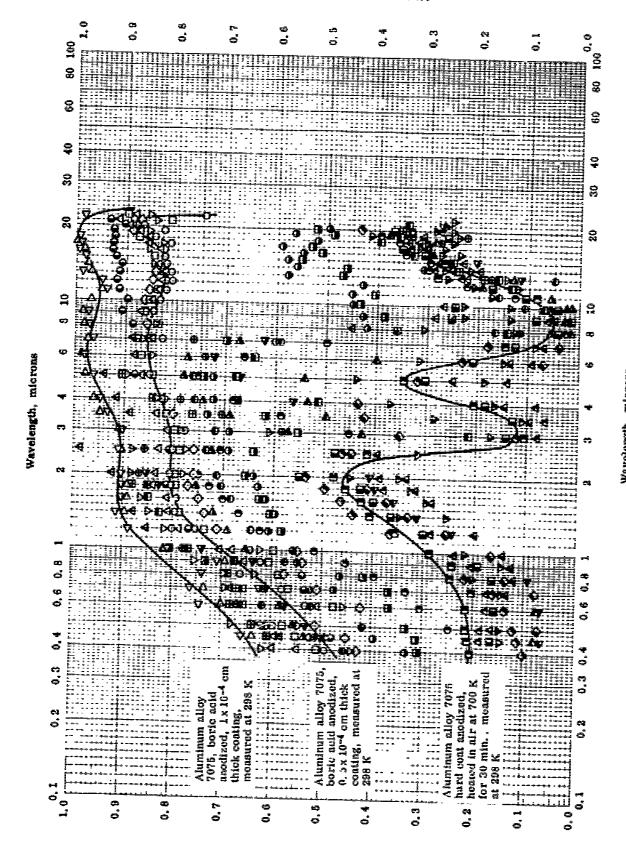
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NORMAL SPECTRAL EMITTANCE -- ALUMINUM + ZINC + EX

REFERENCE INFORMATION

Remarks	Measured in nitrogen.	Measured in nitrogen.	Moasured in mitrogen.
Sample Specifications	Aluminum alloy 7075, norminal composition: 5.1-6.1 Zn, 2.1-2.9 Mg, 1.2-2.0 Cu, 0.7 Fe, 0.5 Si, 0.18-0.4 Cr, 0.3 Mn, and 0.2 Ti; surface roughness: 0.114 and 0.081 microns in x and y directions respectively.	Aluminum alloy 7075, surface roughness: 0.048 and 0.064 microns in κ and y directions respectively.	Aluminum alloy 7075; surface roughness; 0, 081 and 0, 112 mierons in x and y directions respectively.
Rept. Error%			
Wavelength Range. 12	0, 27 - 1, 4	0, 25-27	e, as. 7
Temp, °K	123	323	32.5 5
Ref.	63-18	87-13	63-18
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Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- ALUMINUM + ZINC + EN

Normal spectral reflectance -- aluminum + zinc + ΣX_1

NORMAL SPECTRAL REFLECTANCE - JMINUM + ZINC + ZX, (continued)

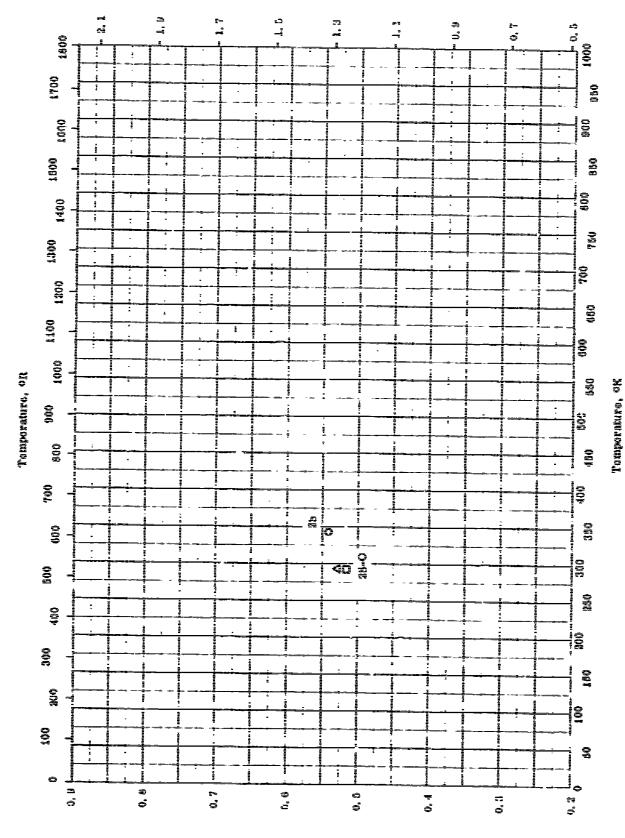
ZOLL KRECKZI MOZKERE

Sym Total	Ref.	Temp, ^o K	Tomp. ok Wavelungen	Rapt.	Sample Specifications	Koraya
₽	61-22	- 6 6 6	0, 45-1.0, 0		Samo na abovo. [Author's dosign.; Sample 87].	Same as abovu.
•	61-22	585	0,46-7,0		Same na above.	Same as above.
v	61-22	714	0, 453. 0		Same as above.	Same as above.
Δ	- C	80%	0.45-20,0		Same as above.	Same asabove, after high temperature runs.
8	0123	89	0, 4-17, 0		Same as above. [Author's design,: Sample 88].	Treated same as above and heated in air at 700 K for 30 min.
	7 - 7 - 9	888	0,45-20,0		Same as above. [Author's design, 1 Sample 80].	Mechanically polished and electropolished; hard cont anodizing (1/3 standard time).
4	61. 10	808	0, 4-20, 0		Aluminum alloy 7074. [Author's design.: Sample 129].	Mill finished and electropolished, hard contarodized; scaled; in 10.6 mm Hg vacuum.
>	25. 1.0	## ##	0, 45-20, 0		Akunirum alkay 7076. [Authorin design.: Sample 85].	Mechanically polished hard coat anodized; in 10" mm ig vacuum.
•	87 - 75 9	80	0, 4-20, 0		Aluminum alloy 7075. [Author's design, 1 Sample 11].	Treated same as above except shorter anothaing (1/3 standard) and sealed.
4	3 1 3 4	8	0, 4621, 0		Aluminum alloy 7075. [Author's design.: Sample 63].	Mechanically and electropolished; sulfuric acid anodized; scaled; in LO ⁻¹ mm Hg vacuum,
Δ	6.1.12	4 64	0, 46 - 16, 0		Samo as above.	Sarne as above,
6	- T9	200	0, 4-13, 0		Same as above.	Suma as above,
THE STATE OF THE S		Annual muching character and c	HITTER WITH CHANGE AND WATER	***************************************	(CONTINUED NO. DATE)	

NORMAL SPECTIAL RELECTANCE --- ALUMINUM + ZINC + EX. (continued)

<u> </u>	Rof.	3, 'dinaj,	Kanga, 4 Errir	Sariple Specifications	TY O EN 9.1-4.5.
•	21 12 20	7. I.A	0, 4=30, 0		опелитеритеритеритеритеритеритеритеритеритер
<u> </u>	28-10	*68	0,4-20,0	Same as above.	Same as above after previous high tempera-
-					ture rung,
£	81 51 1 2	i d	0, 45-21 0	Alaminum atley 7075. [Author's design, 1 bample 64].	Mechanically and electropolished; suffaric acid anodized; 1, 4 x 10"4 cm thick conting;
\(\theta\)	81 87 10	308	0,4-19,0	Aluminum alloy 7076, [Author's design, 1 Sample 65],	
€	61.23	3	0, 4-10, 0	Alumman alloy 7076, [Author's design, r Sample 66].	
>	61.22	Z.	0,4-22,0	Aluminalley 7075, (Anthor's design., Sample 73].	Same us above and scaled,
£	77.79	-	0,45 20,0	Aluminum attey 7076, [Author's design.: Sample 74],	Mechanically polished; sulfaric acid ano- dized L'3 standard times, sembol.
					in 10"s mm ikg vacuum,

THERMAL CONDUCTIVITY ... ALUMINUM + 22%



The result Conductivity, set Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

TPRC

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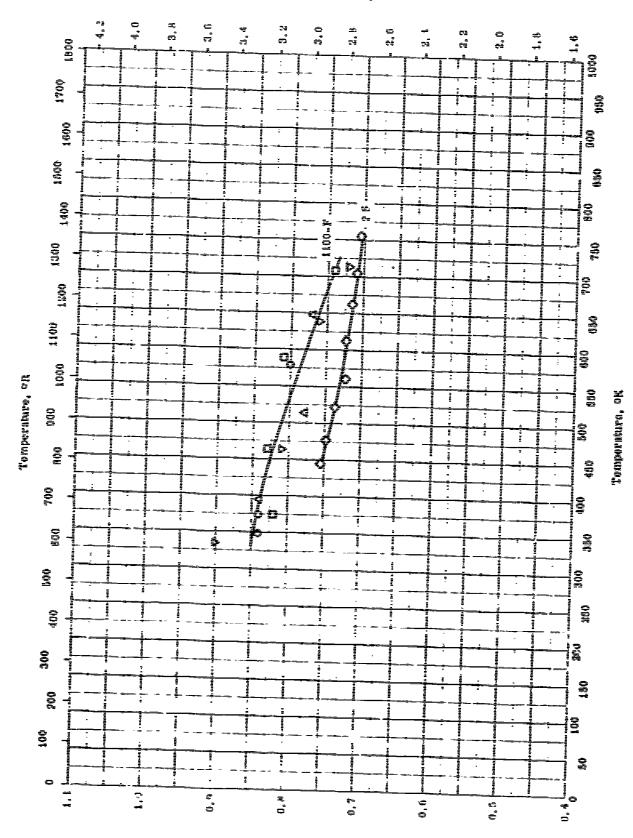
والمراجع والإداراة والموافقة الإسلام المتعارف والمتعارف

Thereal conductivity ... aluminum + Em

REFERENCE INFORMATION

Home	КСКЛА РКП	Table (rd In Virginian)		Hatrum. Dead woft anasolie.					
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Men.	Error %		e =		-	 	 -		 <u> </u>
	Links of	5	9 2 3	9000		 	 		
Herf.	Ē		75						
)	4	0	 	-	 		

Thermal differently -- Althings + 23.



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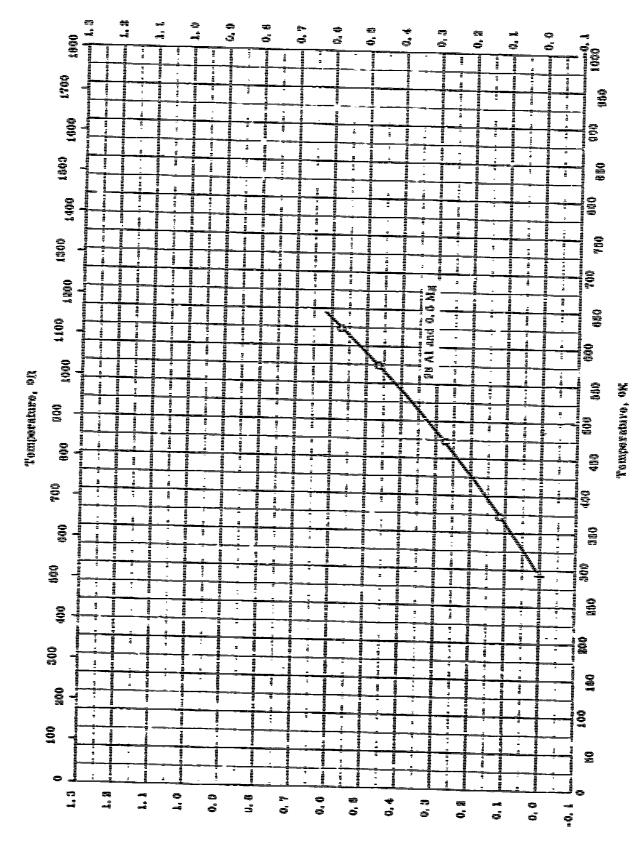
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THERMAL DIFFUSIVITY ... ALUMINUM + ESG

REFERENCE INFORMATION

анго мистепнитепностинентинентинентинентинентинентинентине	Nontured after feath expoures to radiation and	The above sumply again exposed to radiation and followed by cooling.	The above pample again exected to radiation and followed by upoling.	Seventh exposure of the above numble to radiation and followed by cooling.			
Triping promoposem parameter and the properties of the properties	1100 - F: 1.0 mms (Fe + M), 4.1 mms Cu, 4.1 mms Zn, 6.05 Mn, med 6.05 each and 6.15 max in total others: compost- tion from Metal's Handbook,	Burno dis above.	Masse on those,	Correct the abouter.	2 31 1.0 mm (Fig. 54) and 6,2 max Cu.		
		1					
Land.	14 N 1 T H	175.70*	1961 - 13df	1110-7 M	D02 - F4-4		
Hest.	÷		- -		# 02		
	0	Ω	⊲ .	Þ	^		

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THEFTHAM I LANGAI BEFFAMING -- BEFFALLEIDH + ALDMINGM + EK

تتعصرة يعصنا ليجمعن

Thermal linear expansion -- Beryllium + Aluminum + Ex₁

Romarks	Cast in tron mold.
Sample Specifications	71.3 Be, 27.9 Al, 0.5 Mg, 0.25 Fe, and 0.04 > Si.
Repr.	
Temp. Range ok	203-623
Ref.	C ## **********************************
Sym Floring	0

PROPERTIES OF BERYLLIUM + MAGNESIUM + ΣX_1

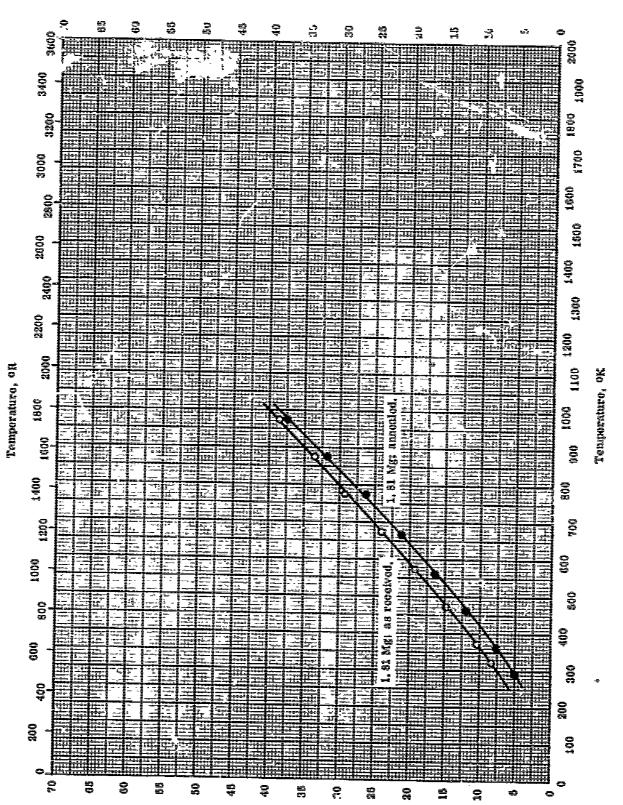
REPORTED VALUES

Densi	ty:	g cm ⁻³	lb ft-3
0	1.81 Mg, 1.52 F, 2nd 0.55 Fe	1.841	114.9
Δ	Same as above	1.839	114.8

PROPERTIES OF DERVILLION + MAGNESIUS. + EX

Kenarks	₹	Same as above.			- -			
Sample Specifications	86.5 He, 1.81 Mg, 1.52 F, 0.55 Fe, 0.06 Al, 0.035 Ca, 0.032 C, 0.008 Cu, and 0.005 Mn.	Sume as above.						
Rept.								
Tomp. Range ok	808	808						
Ref.	50 50 50	838						
#2 22	O	4		 	 		 	

Blectrical registivity -- Beryllium - blackeshk - by



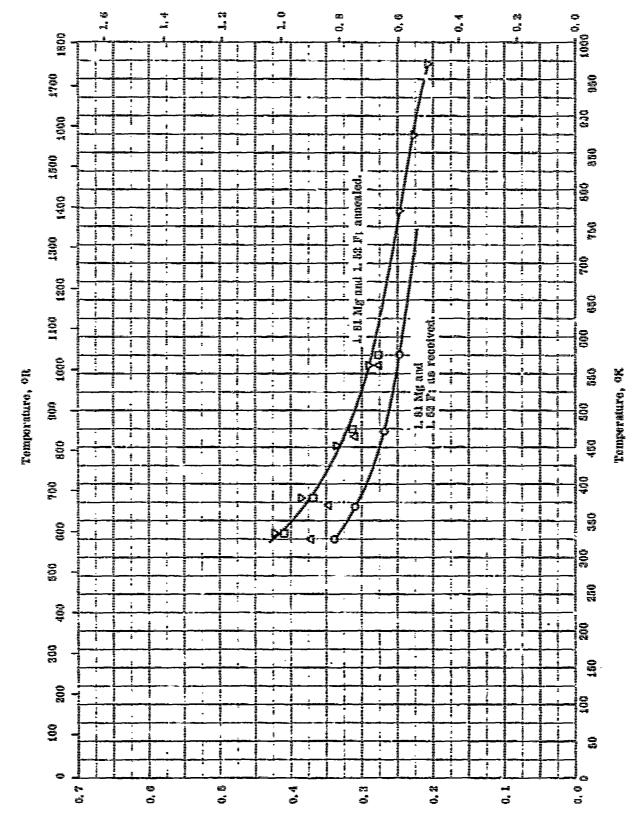
Electrical Resistivity, ohm cm x 10⁶

electrical resistaty -- Beryllium + Nacnesium + XX₁

The state of the s

TO DE BERTHAMEN TO THE PROPERTY OF THE PROPERT	As received; chill-cost,	The above speckron heat treated to about 700 c. after being machined from a chils—cast bar.
garanten menten men Bara plo Spool Kotallons	06.6 Bo, 1.81 Mg, 1.52 F. 0.85 Fe, 0.06 A1, 0.035 Ca, 0.052 C, 0.008 Cu, and 0.005 Mm; density 113.9 tb tc ³ .	Balm of the ribbovo.
Krror %		
Komp. Range ok	203-873	87
Rol.	83-6	- - -
	0	

Thensal condicity -- Beryllium + Magnesum + Ex



Thermal Consisting, on Sectors in 177

Thermal conductivity -- Berellank + Machebium + 224

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	Erro 90 Sansamente de Corta Co	00. 5 He, 1. 81 Mg, 1. 82 F, 0. 85 Fe, 0. 06 Al, 0. 035 Cu, 0. 033 C, 0. 008 Ca, 0. 008 Mai density 114. 6 M ft ⁻³ .	Butte Les abgova,	Erms as above, density 1.14, 8 lb g."	Shrun an above,						
Tebr.	% JOI 1	<u> </u>						 			 - ,
	T	323-673	242	010-040	033**973					<u></u>	
Ref.	1		2	- - - -	9-0		-				
		0	0	4	Þ					 , . ,	 - 1
								3	 		

PROPERTIES OF RESYLLIUM $+\Sigma X_i$

REPORTED VALUES

Decelly:

g cm⁻¹

Br a^{−2}

♥ \$8.1 B

1.873

113,8

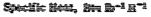
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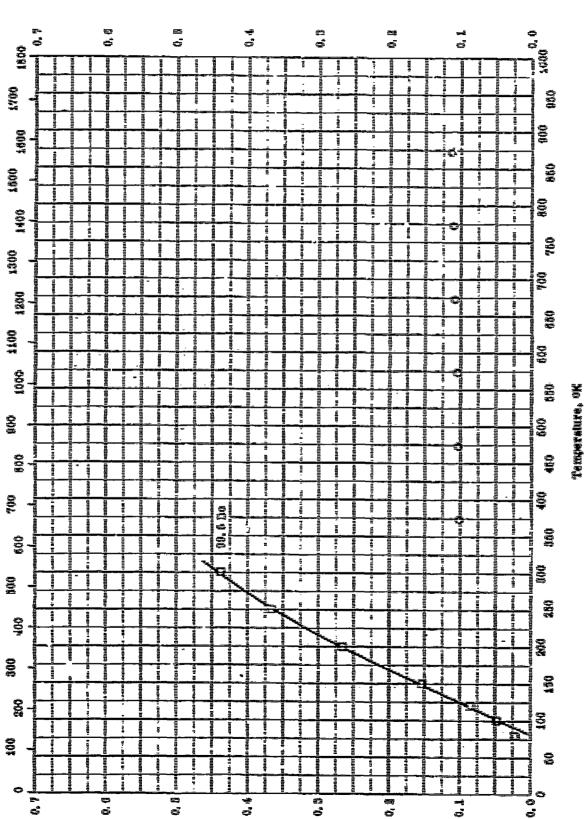
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REFERENCE INCOUSING

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торы у катарыны катарыны катарынын жарын	Gorman flake from Am. C. E. Co.; 58.5 pure, 0.018 Be- Insoluble in ICh. 0.13 We, 0.13 Al. 0.08 Cl., 6.03 Cu, and remainder was insoluble matter which consisted of BaC con- taining about 3 Al ₂ C ₈ ; taining about 3 Al ₂ C ₈ ;
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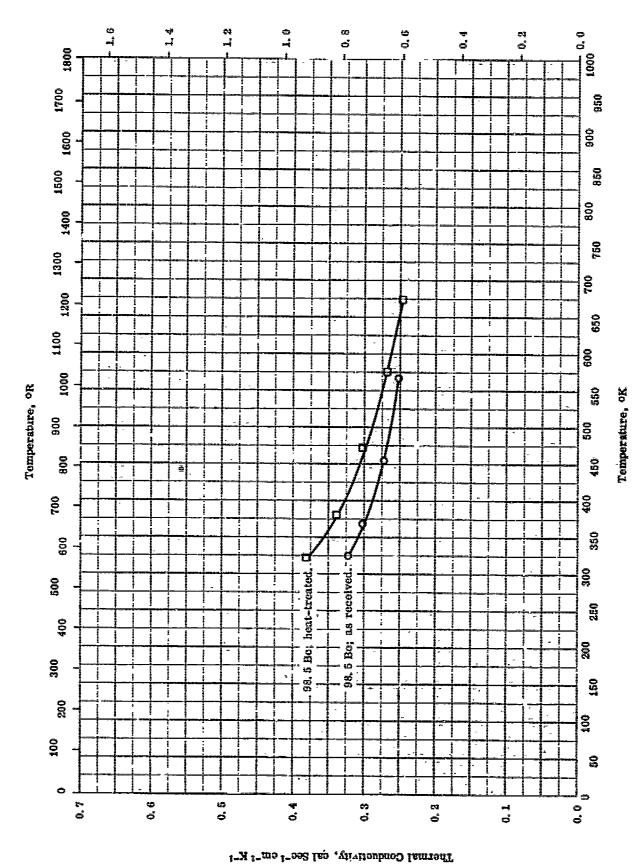
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SPECIFIC HEAT -- BERYLLIUM + ZX

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REFERENCE INFORMATION

Remarks										
9							يدر.	 	حيــــــــــــــــــــــــــــــــــــ	
Sample Specifications	Boryllium alley.	99. 5 Be, 0. 15 Cl ₂ , and 0. 10 C ₂ .								
Rept.	٠- وأ			,						
Temp. Range ok	373-873	0-300				 				-
Ref.	60-12	51-16	 		_					
髭			 			 		 		

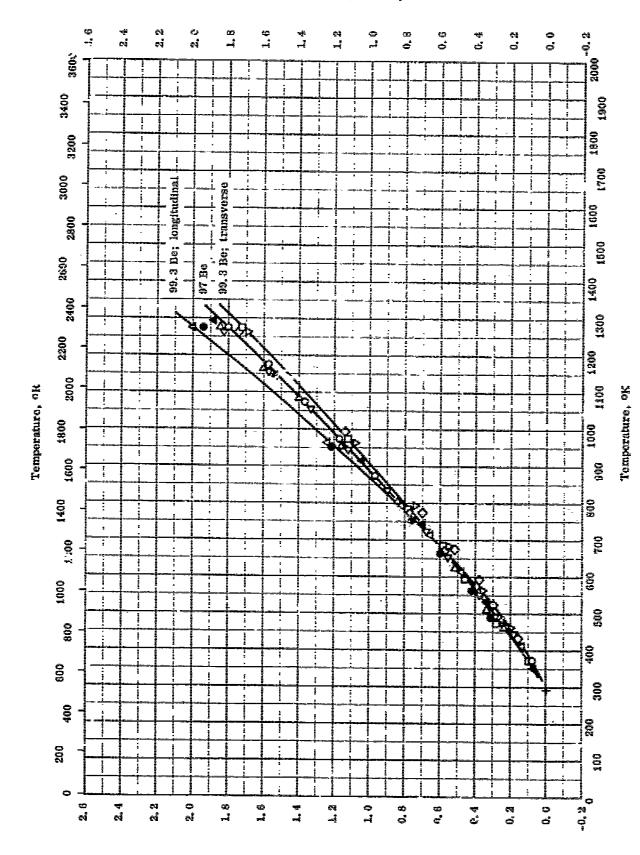


Thermal conductivity -- Beryllium + 234

THERMAL CONDUCTIVITY --- BERYLLIUM + EX

REFERENCE INFORMATION

Ramarks	As received.	Same as above except heat-treated to about 700 C.	
Sample Speetfleations	German Flake; 98, 6 Be, 0, 18 Be lusoluble in H Cl, 0, 18 Fe, 6, 13 Al, 0, 63 Cu.	Same as above.	
Rept. Error %			
Temp.			
Ref.	53-5	535	
Sym Dol	0	0	



THERNAL L''64. "XPANSION -- BERYLLIUM + 2X,

Thermal Linear Expansion, percent

Thermal linear expansion -- behyllight + $\Sigma imes_1$

Komarks	Transverse; extruded, then vae annealed 1 hr at	800 C; measured in argon aim.	Longitudinal; extruded, then was annealed I hr at	800 C; measured in argon atm.	Transverse; extruded (Iun No. 1); measured in	argon atm.	Same as above (Run No. 2).	Longitudinal; extruded (Run No. 1); measured in	argon atm.	Same as above (Run No. 2).	Same as above (Run No. 3).	Same as above; from author's mon coafficient.	Avorage value of those parallel and perpendicular to hex. axis.	
'. Sataple Specifications	99,28 pure, 0.179 C, 0.170 Fe, 0.140 Al, 0.086 SI, 0.080 C.	0.020 Cu, Mn cack, 0.007 Ni, Ca cach.	Same as above.		Same as above.		Samo as above.	Same as above.		Same as above.	Same as above.	Same as above.	97 Ke, 0.68 Mg, 0.28 Al, 0.141 Sl, 0.094 Fe, 0.07 Ca, 0.06 C, Average value of those parallel and perpendicular 0.04 Ma, 0.01 Ni, < 0.01 Cu, about 2.0 C ₃ by difference.	
Rept. Error %			•											
Tomp. Rango ok	373-1273		373-1273		373-1273		373-1273	373-1273		373-1273	373-1273	373-1273	85.00	
Ref.	60-17		60-17		20-17		50-17	50-17		80-17	60-17	50-17	4013	
E 38	0		4		<u> </u>		Þ	Δ		♥	•	4	0	

properties of boron $+\Sigma X_i$

REPORTED VALUES

Density:

g cm⁻³

lb ft-3

O 99.4 and 99.5 pure

2.35 ± 0.01

146.7 ± 0.6

THE STATE OF THE STATE OF THE PARTY OF THE STATE OF THE S

Phoperthes of Boxon + El

		Rename			·											
MALE TO THE PROPERTY OF THE PR		Two amendations	"SOUNDED IN THE STATE OF THE ST													
	Kopt. Error%										 -	-				
	Range of	208								 	 -		-		_	PHINISTERNAMENTON PROPERTY OF THE PARTY OF TH
Γ	Ket,	57-36								 	 				_	THE PROPERTY OF
E	:32	0		 						 						
						7	PRO	;	<u> </u>	 - (]	

PROPERTIES OF CERIUM +SILICON + ΣX_1

REPORTED VALUES

Melting Point:

K

R

O 0.4 >Si and 0.22 > Fe

1088

1959

PROPERTIES OF CERIUM +SILICON + EX

Komarks	± .
Sample Specifications	99.66 + pure 0.40 > 81, 0.22 > Fo. 0.15 > Ca. 0.08 > Aland traces of Mg.C. Pr.
Kept. Error %	
Temp.	
Ref.	# # # # # # # # # # # # # # # # # # #
# <u>Z</u>	0

PROPERTIES OF CERIUM $+\Sigma X_i$

REPORTED VALUES

Meli	ing Point	K	R
٥	98.5 Ce	1040±3	1972 ± 5
0	98-99 Ce	1050	1891
Δ	99.3 Ce	1058 ± 5	1905 ±9

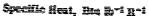
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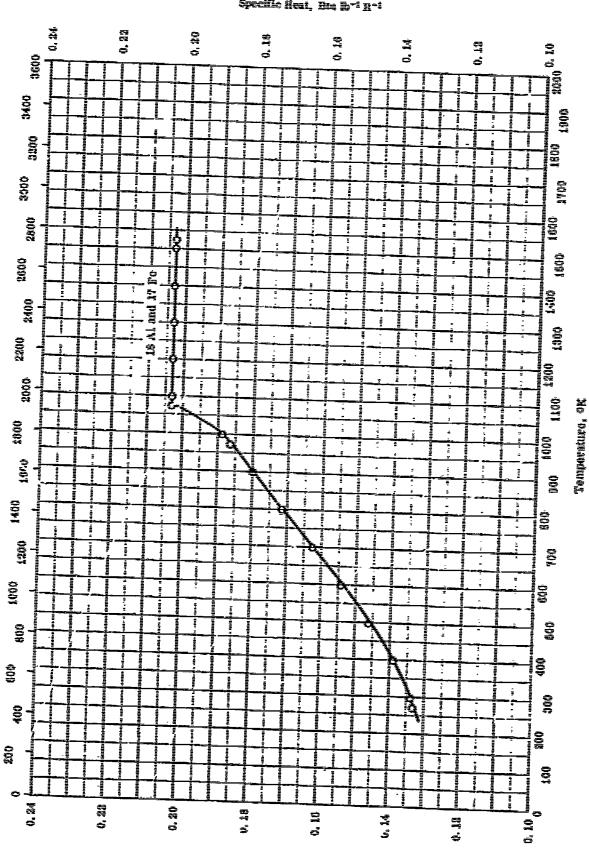
	Athen wherements and the second secon																
Hiiriii hahranda kamana ka		98.5 pure, 1 other rare earths, 0.1 C; residue undetermined.	98-99 Co. 0. 14 each Fe and Mg, and 0.03 Sl.	29.3 Co. 0.18 alkaline earth metals. 0.13 C. and 0.4 Arthur	Ravo carth.												
Ropt.	K-LLOL 76					-			 	- <u></u>		-	 				
Long. One.	1		7807	1058				_					 		-		
Ref.	-	:- :-	6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-	55-87					 		-			<u> </u>			
E 02		0	D	4									 				



Specific mag ... chrosion - alchinus - 2x

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Transportations of

 $\hat{Spectio} \text{ Heat, cal } g^{*1} K^{-1}$

SPECIFIC HEAT -- CHROMIUM + $\Delta LUMINUM + \Sigma X_1$

INFORMATION

REFERENCE

	Remarks			
Sample Specificat: .1s	63 91 C:	or of Cr., 10, 11, 10, 55 Fe, 0.67 Si, 0.024 C, and 0.006 S.		
Rept.	4.0			
Temp. Range og	273-1523			
Ref.	60-13			
E E	0			

TPRC

dissented hands of the fartherings was because on the extension of the control of

Properties of Chromium + iron + Σx_i

REPORTED VALUES

Dens	ity:	g cm ⁻³	lb ft⁻³
Þ	22 Fe and 22 W	8.4290	526.21
0	23 Fe and 20 Mo	7.7476	483.67
▲	20 Fe and 20 W	8.2688	516.21
	25 Fe and 15 Mo	7,63	476
Δ	0.7 Fe and 0.34 Si	7.136	445.5

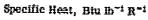
PROPERTIES OF CHROMIUM + INON + ZX

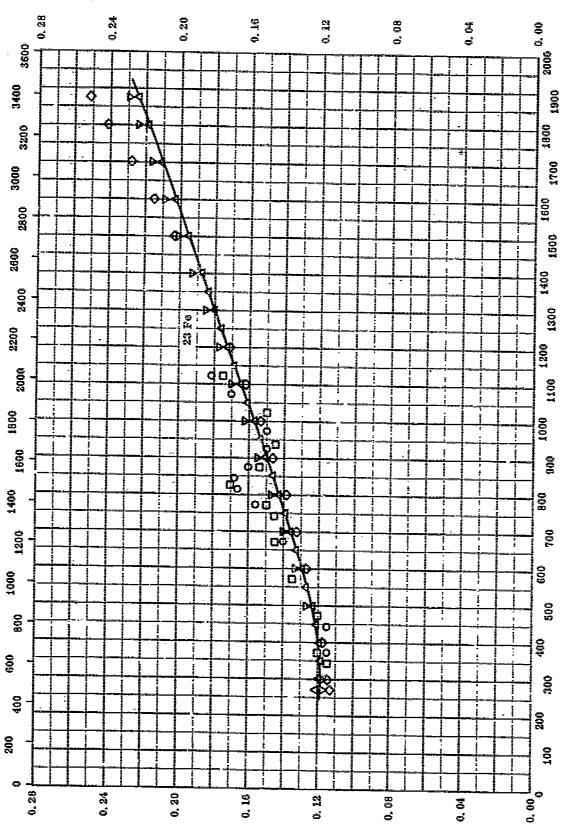
REFERENCE INFORMATION

Remarks	As cast,	As cast.	As cast.	As cast.	Hot-swaged,	
Sample Spectflentions	54 Cr, 32 Fe, 23 W, 3 Mu, and 0,021 C.	57 Cr. 33 Fe, 20 Mo, and 0.018 C.	58 Cr., 20 Fe, 20 W, 2 Mo, and 0.018 C.	60 Cr, 25 Fe, and 15 Mo.	98.3 Cr., 0.7 Fe, 0.34 St, 0.08 C, 0.66 Mn, and 0.014 N.	
Rept. Error %						
Temp. Range OK		208	298	298	208	
Ref.	46-2	46-2	5 -9	6-2	41-4	
Sym	Δ	0	4	O	٥	



SPECIFIC HEAT -- CHROMIUM + INON + EX





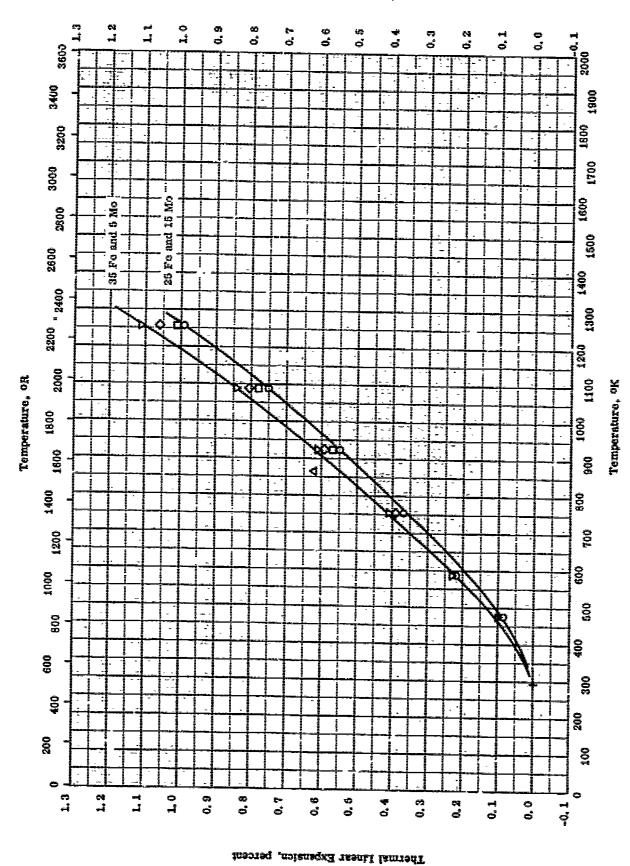
Temperature, oR

Specific Heat, cal g⁻¹ K⁻¹

Specific Heat -- Chronium + Iron + IX

REFERENCE INFORMATION

	Remarks	Heated for 3 hrs at 1000 C in vacuum electric fur-	room temperature at 30 C hr".	Same as above,					
	Sample Specifications	55.57 Cr: 43.286 Fo, 0.95 Si, 0.12 Ai, 0.041 Nz, and 0.034 C.	5.5 Co. 10 Co. 1	Carboniess ferrochromium alloy; 76.45 Cr. 22.792 Fe, 0.35 St.	0.26 C. 0.14 Al, and 0.008 S. Mtratod ferrochromium: 77.75 Cr. 18.787 Fe, 1.20 Nz. 0.70 Al, 0.52 Sl. 0.028 C. and 0.014 S	Aluminothermic chromium; 98.66 Cr. 0.64 Fe. 0.43 Al. 0.20 Si.			
7 Kapt.	Error %			e -	D. E	0.8-1.2			
Femp.	Range OK	o-to-3 1. 1.63	343-1123	373-1873	273-1873	273-1873			
Ref.	53.12		55-13	60-13	60-13	60-13			
15 S	0		0	₫	Þ	\rightarrow			-



Thermal linear expansion -- Chromium + Inon + Ex_i

Thernal linear expansion --- Chromium + Inon + Ex

HEFERENCE INFORMATION

Sym Ref.													
ı İ	46-2	46-2	64 65 67	46-2	6-9					 			
Tomp. Range ok	2971256	207-1286	207867	207-1206	297-1256		 _		 			<u>-</u> -	
Rept. Error%									 		<u> </u>	_	
Salty Specifications	00 Cr, 25 Fo. and 16	Same as above.	60 Cr. 30 Fe, and 10 Me.	60 Cr. 33 Fe, and 6 Me.	Samo as above.								
	Romarks	A.S. CR.S.	Aged 200 hrs at 1665 F.		A CRASS.								

PROPERTIES OF CHROMIUM + MOLYBDENUM + ΣX_i

REPORTED VALUES

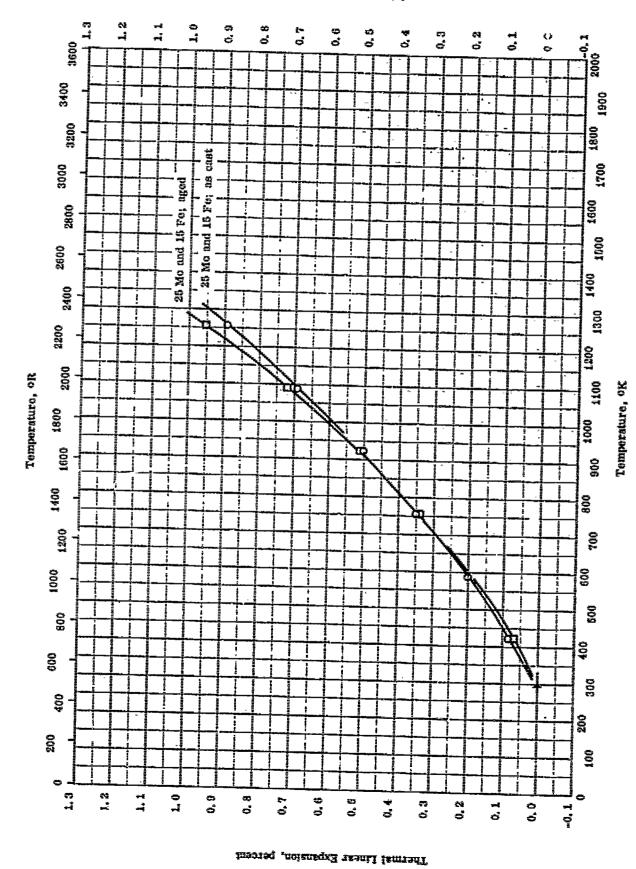
Density: g cm⁻² lb ft⁻³
O 25 Mo and 15 Fe 7.87 4.91

Properties of Chromium + $molkubenum + Dx_1$

	-	 	 					_	
Meaning the comment of the comment o	As Cust.								
gantheatheatheas	25 Mo, and 1								
Rept.							 -		
Temp. Rangg OK	908								
Kof.	462					 	 -		-
3 3	0	 	 	 		 	 		







Thermal linear expansion -- chromium + molyboenum + $\mathbb{E} \mathbf{x_i}$

TPRC

Thermal linear expansion -- Chromium + Molybobnum + 13%

	KAGANA N.F. I.C. E.	As cast.	Agest 200 hrs at 1600 F.	
Territy. Raft.	23. Г.С. Д.С. Д.С. В.С. В.С. В.С. В.С. В.С. В	60 Cr. 26 Mo, and 18 Fo.	Same as above.	
Kept.	M. Lore			
Terror	Canas ok	207-1256	307-1366	
Ref.	WILF CRIMINAL SERVICES	4 6-2	6-04	
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PROPERTIES OF CHROMIUM + NEXEL + EX

REPORTED VALUES

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2272

PROPERTIES OF CHROMIUM + NICKEL $+\Sigma x_{\rm I}$

REFERENCE INFORMATION

<u> </u>			 	 	
Remarks	M.P. by visual observation.				
Sample Specifications	48 Cr, 40 Ni, and 12 Mo; nominal composition.				
Rept. Error%	e #				
Tamp.	1568	•			
Ber.	55-28				
E S	0		 	 	

TPRC

PROPERTIES OF CHROMIUM $\pm \text{SILICON} + \sum_{i}$

REPORTED VALUES

Density:

g cm⁻³

1b ft⁻³

O 1.0 Si and 0.9 Fe

6.974

435.4

PROPERTIES OF CHROMIUM +SILICON $+\Sigma X_1$

Remarks	Cost.
Sample Specifications	86.3 Cr, 1.0 Si, 0.9 Fe, 0.53 C, 0.07 Mn, and 0.03 N.
Rept.	
Temp. Range ok	ଷ୍ଟ ଜୁନ
Ref.	다 다 다
<u>E8</u>	0

PROPERTIES OF CHROMIUM + TUNGSTEN + ΣX_1

REPORTED VALUES

Dens	ityi	g cm ⁻³	II: ft ⁻³
0	29 W and 23 Fe	8.9251	557.18
Δ	29 W and 23 Fe	8.9252*	557 . 19 [‡]
⊽	27 W and 23 Fe	8.7831	548.31
∢	24 W and 22 Fe	8,6244	538.41
Þ	22 W and 22 Fe	8.4290	526, 21
\Q	12 W and 20 Fe	8,4164	525.42
•	22 W and 21 Fe	8.4541*	527 . 78
	22 W and 21 Fe	8,5670	534.82
•	20 W and 20 Fe	3.2688	516.21
₹	20 W and 19 Fe	8,3100	518.78

² Most probable value for alloys of this composition.

properties of chromium + Tungsten + $\Sigma x_{\rm l}$

REFERENCE INFORMATION

I	#																_	 	
***************************************	Reinal	As cast.	As south	As one	As reserve	Ac proces	, was tracted.	מייים מיים מייים מייים מייים מייים מייים מייים מייים מייים מייים מ	to the second for the first form of the second form	As the contract of Acts of the Cartest Acts of	As cost	de la Carte de							
Sample Specifications	***************************************	45 Cr., 29 W, 23 Fe, 3 Mo, and 0.05 C.	45 Cr, 29 W, 23 Fe, 3 Mo, and 0,029 C.	47 Cr. 27 W, 23 Fo, 3 Mo, and 0.026 C.	52 Cr. 24 W, 22 Fo, 2 Mo, and 0.018 C.	54 Cr. 23 W, 23 Fo. 2 Mo, and 0,021 C.	56 Cr, 22 W, 20 Fo, 2 Mo, and 0,018 C.	57 Cr. 22 W, 21 Fo, and 0,621 C.	87 Cr, 22 W, 21 Fo, and 0.021 C.	58 Cr. 20 W, 20 Fe, 2 Mo, and 0.018 C.	59 Cr. 20 W, 18 Fe, 2 Mo, and 0.016 C.								
Rept. Error %												_				-	•	 	
Temp. Range ok		20	308	203	208	298	208	298	298	208	800	_		=					
Ref.		2	46-2	46-2	46-2	46-2	462	6-2	46-2	46-2	46-3	_	 						
86 86 87 87 87 87 87 87 87 87 87 87 87 87 87	•	<u> </u>	4	Þ	▽	Δ	\(\)	•	0	4	>	_	 _		_		_	 	

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PROPERTIES OF CHROMIUM $+\Sigma X_i$

REPORTED VALUES

Den	sity:	g cm ^{−3}	lb ft ⁻³
V	0.43 O ₂ as Cr ₂ O ₃ and hydrated oxide	6.975 [±]	435,4 [*]
Δ	Same as above	7.08	442
0	Same as above	7.15	446
Heat	of Sublimation:	cal g ⁻¹	Ptu 1b ⁻¹
⋄	0.3 O ₂	1802±3	3243 ± A

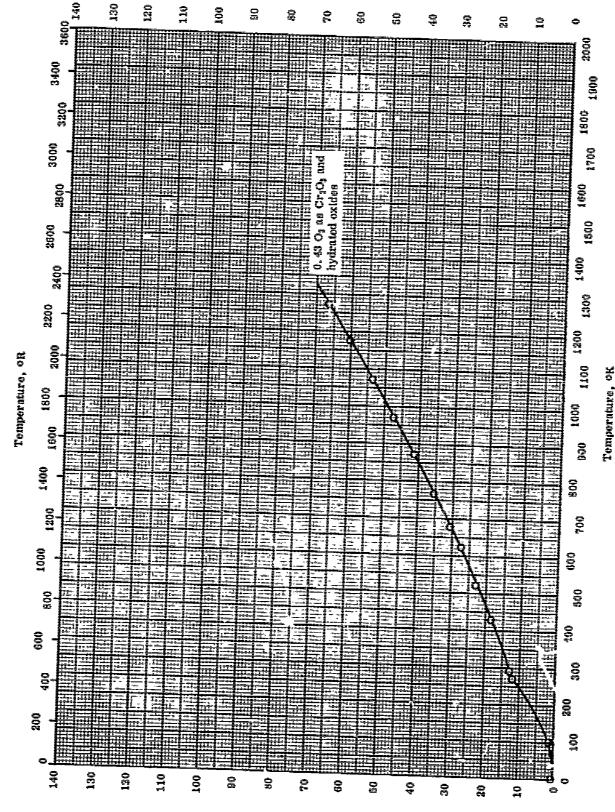
* Mos: probable value for alloys of this composition.

properties of chromium + ex.

,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					_							
Remarks	Ahs from vapor prassure data.	knittal condition	A.h.g. of the above sample measured after beat treatment at 405 C.	A h _B of the above sample measured after heat treated to 1410 C.								
***************************************		Electro-daposited; 0.43 O, as Cr.,O, and hydrated exide.										
tentlons		on pure to						?				
Sample Specifications		7.40 E F										
Sarry	*	÷.										
	99.7 Cr and 0.3 Cz.	clopositio	alxove.	above.								
***************************************	98.7 Cr	Electro-	Samo as above.	Saune as above.								
Ropt. Error %											 	
Temp. Range ok		208	808	& & & &		-						
Ref.	50-11	57-10	37-19	87-13	<u> </u>		-			-	 	
Sym	\$	Þ	٥	0		·			-			

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electrical resistivity -- Chromium + Ex



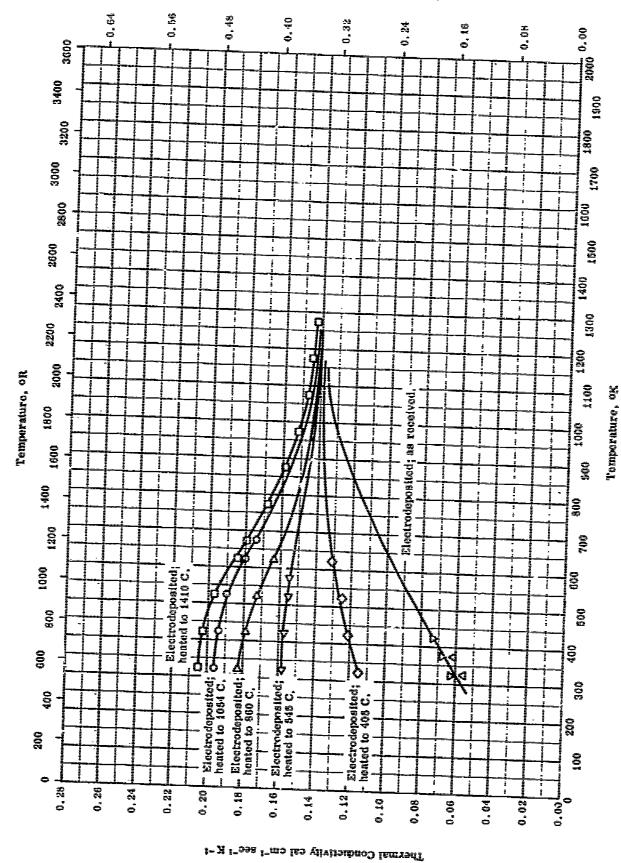
Electrical Resistivity, ohm cm x 104

electrical resistivity -- Chronium + Em

REFERENCE INFORMATION

Romarks	Preheated to 1410 C and cooted; data not shown for lower preheated temperatures given by author.
Sample Specifications	0.43 O ₂ mostly prosent as Cr ₂ O ₃ and hydrated exides.
Kept. Error %	
Temp.	6-1273
Sym Ref.	67-19
	0

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Thermal conductivity --- Chromium + EX

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Thermal conductivity ... Chromum +23,

REFERENCE INFORMATION

T								
Konjarks	Electrodeposited.	After heating to 213 C.	After heating to 408 C.	After heating to 846 C.	After heating to 860 C.	After bouling to 10th C.	After heating to 1410 C.	
		<u> </u>	<u> </u>	<u> </u>	€	-<	<u> </u>	

######################################								
\$ ====================================								
Example Specifications	÷							
Spaalf) oxide							
alden	dratec							
Fando Specification	0. 43 Oz ns Cr2O, nn/ hydrated oxides.							
	o S	XXV6.	XOVO.	ww.	XOVG.	MACA.	*DACK	
Macical Markettannan	o a	Same as above.	Same as above.	Same as abeve.	Carro as abovo.	Brane as above.	Sarris na n'esvo.	
₹.		Sam	- E	- Se	3		Sate	
Kept. Error %								
I		7.3	S	 22 23		- -	202	
Range SK.	323-1373	123-673	323-623	123-673	323-623	323-684	323-1267	
Ref.	57-2	\$7 2	2 2	67-2	51-2	87-2	372	
5 2	∢	Þ	0	V	Δ	0	0	

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PROPERTIES OF CORALT - CHROMIUM - ΣX_i

REPORTED VALUES

Dens	ily **	g c m .	њ £ ⁻⁹
0	Stellie No. 21	8.# [*]	\$18 [*]
⋖	Salita Xo. 21	ŝ, .\$	511
Δ	Stellite No. 23	8.54	533
^	ilepies allep Ko. Z	\$. 15 [*]	571 [±]
¥	Sellie Ho. 🦮	8.31	519
-	Scilite No. 31	\$.\$1 ^e	₽
*	Stellite No. 31	8. 68	521
#	Stellite No. 31	\$.₩	\$37
A	dayses alloy No., 14	9.04	26 4
Ŧ	## Crami ÷ ₩	8.44	539
>	Jaso G1	\$. 2 \$	Şiz
Melt	ing Point	E	â
0	Yulien	166	339
€	部の単き甲	1633	3

^{*} Most probable value for alloys of this composition,

See the following figure for oblitical information on densities as a function of temperature.

PROPERTIES OF COBALT + CHROMIUM + ΣX_1

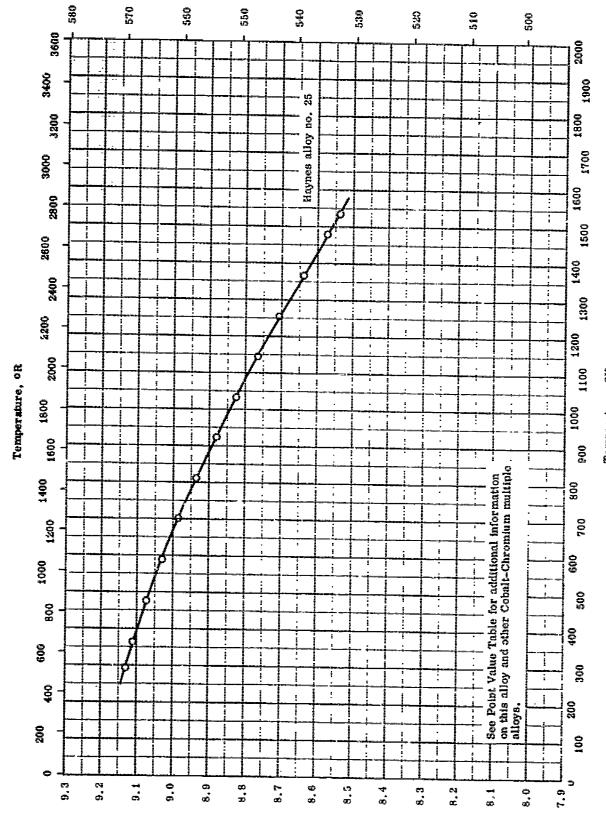
REFERENCE INFORMATION

Remarks	Reacted with SiC support; in vacuum; M.P. by collapse of hole in disk.							Powder mixed 15 hrs., pressed at 70,000 psi, sintered 8 hrs at 1325 C in dry H ₂ .
Sample Specifications	Vitallium;25-35 Cr, 4.5-6.5 Mo, 1.5-3.5 Ni, 2>Fe, and 0.2-0.35 C.	Stellite N ., 21 (AMS No. 5385; NDRC No. NR-10);25-30 Cr, 4.5-6.5 Mo, 1.5-3.5 Ni, 2>Fu, and 0.2-0.35 C.	Stellite No. 23 (AMS -5375; NDRC-61); 23-29 Cr., 4-7 W, 2>Fe, 1.5 > Ni, and 0.35-0.5 C.	Haynes Alloy No. 25 (L-605); 19-21 Cr, 14-16 W, 9-11 Ni, 1-2 Mn, 2 > Fc, 1 > Si, and 0.15 > C.	Stellite No. 30 (AMS-5380; NR-12); 23-29 Cr., 13-17 Ni, 5-7 Mo, 2 > Fe and 0.35-0.50 C.	Stellite No. 31 (AMS-5382; NR-71); 23-28 Cr., 9-12 Ni, 6-9 W, 2> Fe, and 0, 45-0,66	Jaynes Alloy No. 36 (L-251); 17.5-19.5 Cr. 14-15 W, 9-11 NI, .> Fc 1-1.5 Nm, 0.35-0.65 Si, 0.35-0.45 C, and 0.01-0.05 B.	36 Cr and 6 W; nominal composition. (continued onto next p.20)
Rept.								
Temp.	1688	298	28.89	5308	2598	& 66 87	298	1693
Ref.	93.19	50-3 also 47-2	50-3 also 47-2	50-3 also 47-2	50-3 also 47-2	50-3 also 47-2	50-3 also 47-2	52-14
Sym	o	0	₫	⋄	D	Δ	◀	•

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PROPERTIES OF COBALT + CHROMIUM + EX. (Continued)

Remarks	Same as above.	A Prepared like a cermet; compacted at 60,000 ps. with camphor, and sintered 30 min at 2500 F.				
Sample Specifications	Same as above.	Haynes Stellite 31 (x - 40); 23-28 Cr, 9-12 Ni, 6-9 W, 2 max. Fe, Prepared like a cermet; compacted at 60,000 psi and 0.45-0.60 C.	Sarne an above.	Jessop G 32 (British design.); 46.6 Co. 15.1 Cr. 16.5 Nt. 3.0 V. 2.2 Mo. 1.4 Nb. 0.77 Mn. 0.52 St. and 0.27 C.	Stellite No. 21; 60, 49 Co. 26, 69 Cr., 5, 42 Mo, 2, 28 NJ, 1, 54 Fe, and 0, 258 C.	
Rept. Error %						
Temp. Range og	298	85.23	298	298	508 708	
Ref.	52-14	55-31	16-39	27 28 29	13 03 04	_ · · · · · · · · · · · · · · · · · · ·
Sym	>	•		*	▽	



DENSITY -- COBALT + CHROMIUM + EX,

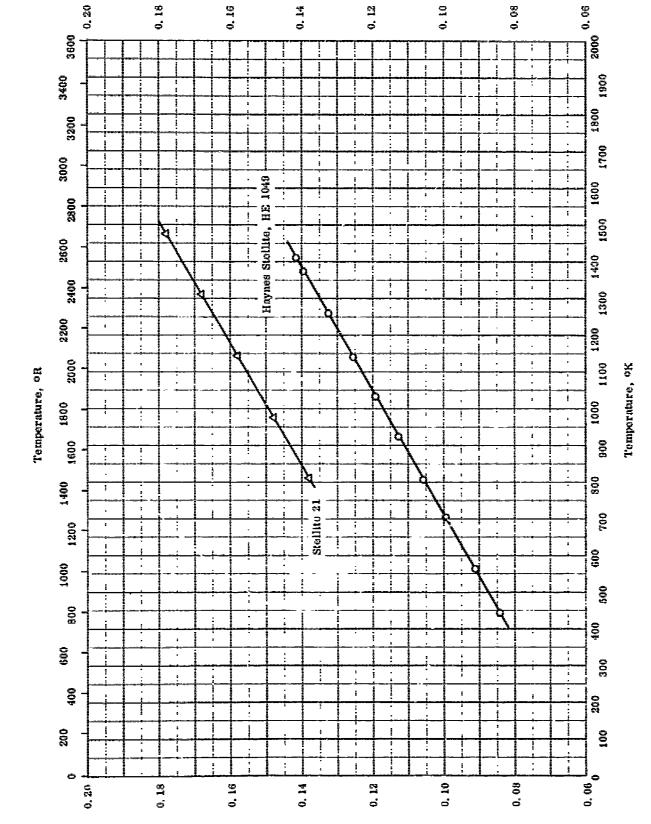
Density, gcm-3

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appropried and the control of the co

Density -- Cobalt +chromium +EX

Remarks					
Sample Specifications	Haynos alloy no. 25; 21 Cr. 16 W, 11 Ni, 3 Fe, 2 Mn, 1 Si, 0. 15 C, 0.04 P, and 0.03 S.				
Rept.	L			 	
Temp. Rango og					
Ref.	62-16				
Sym	0				



SPECIFIC HEAT -- COBALT + CHROMIUM + EX

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Specific Heat, cal g"! K"!

SPECIFIC HEAT -- COBALT + CHROMIUM + $2x_L$

Remarks Research		Under hellum atmosphere.	
Sample Specifications	Stellite 21; composition before test: 60,49 Co, 26,69 Cr, 5,42 Mo, 2,38 Ni, 1,54 Fe, and 0,258 C, and composition after test: 62,27 Co, 26,74 Cr, 5,42 Mo, 2,42 Mi, 1,23 Fe, and 0,246 C; density 511,2 lb ff ⁻³ .	Haynes Stellite, HE 1049; 43.6 Cc, 26,0 Cr. 15,0 W, 10.0 Ni, 31 0 Fe, 0.8 Mn, 0.8 Si, and 0.4 B; density 552 lb R ⁻³ ,	
Rept. Error%	o :	o n	
Temp. Rarge ok	8101440	444-1412	
Ref.	87 86 13		
Sym Sym	0	4	

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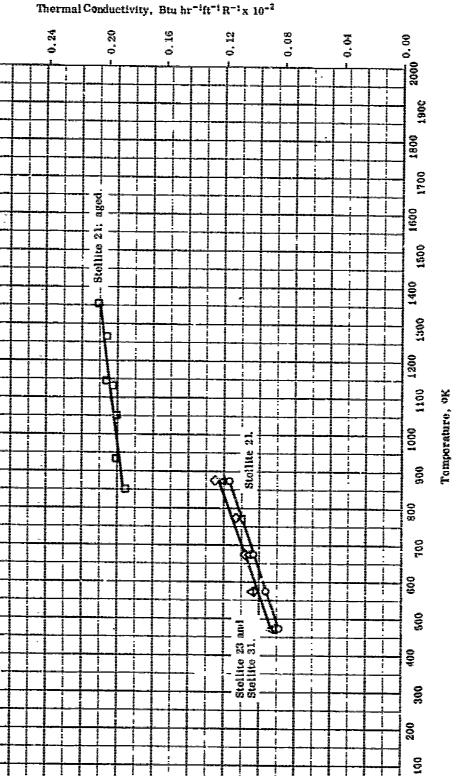
0.14

0.13

0.10

Temperature, on 1800 0.32

0.28



THERMAL CONDUCTIVITY -- COBALT + CHROMIUM + EX

Thermal Conjuntivity, cal $Sec^{-1}cm^{-1}K^{-1}$

0.08

<u>\$</u>

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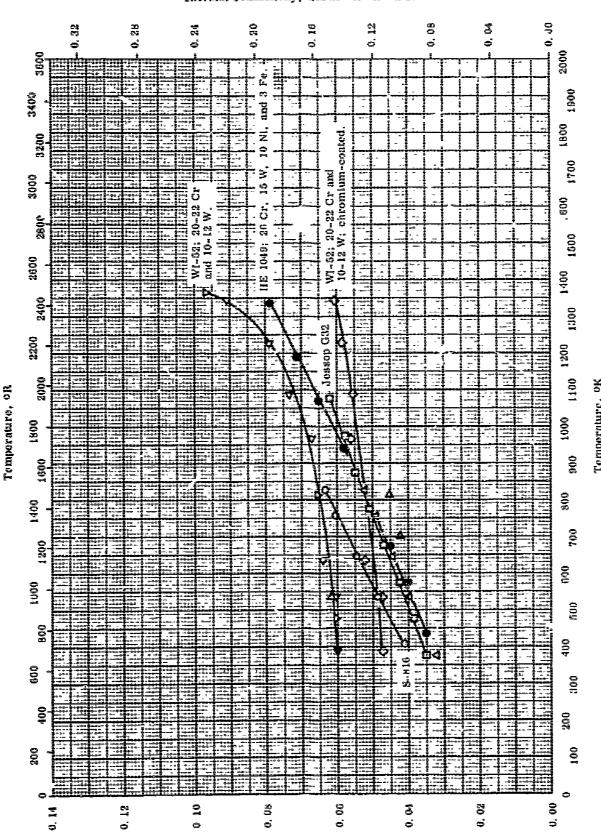
0.00

0.08

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THERMAL CONDUCTIVITY -- COBALT + CHROMIUM + ΣX_{\parallel} (Stollios)

ROBALE RECOGNIS AND AND AND AND AND AND AND AND AND AND		. 42 Aged 16 hrs at 1.400 = 2000 F before lower temp. data are taken.	*	T
тания по пределения пределения по пределения по пределения по пределения по пределения по пределения по пределе В СТВ В В В В В В В В В В В В В В В В В	Stallite 21 (AMS-5385, NRDC-10); 25-30 Cr., 4, 5-6, 5 Mo, L. 5-3, 5 Mi, 2, 9 max Fo, 0, 20-0, 35 C; donetly 518 lb ft ⁻³ .	Stellite 21; composition before test; 60, 40 Co, 26, 69 Cr, 5, 42 Mo, 2, 38 Mi, 1, 54 Fe, 0, 268 C and after test; 62, 27 Co, 26, 74 Cr, 5, 42 Mo, 2, 42 Mi, 1, 23 Fe, 0, 264 C; density 611 lb ft ⁻³ .	Stellite 23 (AMS-3375, NRDC-61); 23. 0-29. 0 Cr, 4. 0-7. 0 W, 2. 0 > Fe, 1, 50 > Ni, 0, 35-0, 50 C; density 533 lb (1-3.	Stollite 31 (AMS-6382, NRDC-71); 23 - 28, 0 Cr., 9, 0 - 12, 0 M, 6, 0 - 9, 0 W, Fo < 2, 0, 0, 45 - 0, 60 C; density 538 ID II - 1.
Kept. Extor %		0 %		
Ranks ok	473-873	8401356	473873	473873
Ref.	4 	60 60 60	64 1 2-	4. F. E.
£8	0	O	٩	⋄



Thermal conductivity -- cobalt + chromium + Ex

Thermal Conductivity, cal Sec-tem-1K-1

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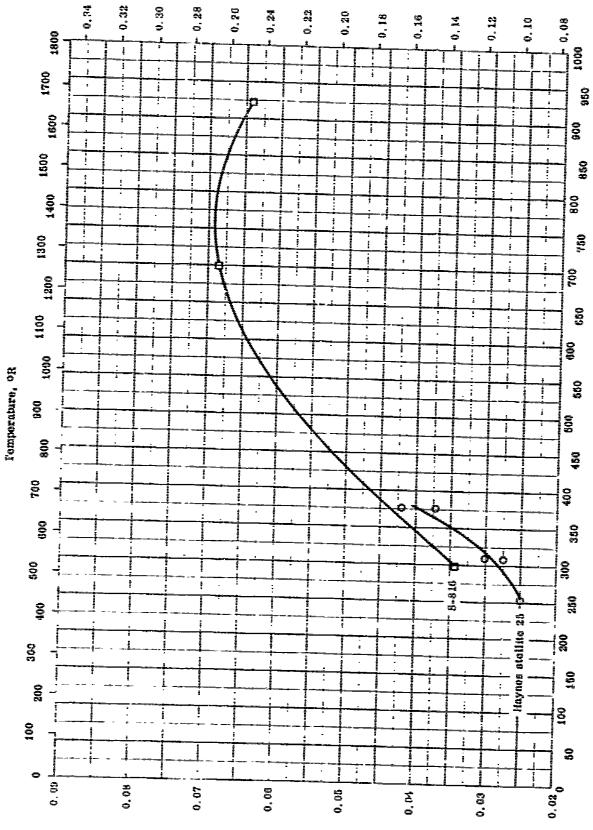
Thermal combuctivity -- codalt \cdot chromium $+\Sigma x_{_{\! 1}}$

******	***************************************							,		
Remarko						Checking occupation	THE CONTRACTOR OF THE CONTRACT	Samples contained 6 one-inch dia dises.		
Ropt. Error % services and services are services and services and services are services and services and services are services and services and services are services and services and services are services and services and services are services and services and services are services and services and services are services and services and services are services and services are services and services are services and services are services and services are services and services are serv	c	Jeasop G72 steel (British Design); 40.6 Co, 19.1 Cr, 10.5 Ni, 7.0 V. 2.7 Mo, 1.4 Nb, 0.77 Mn, 0.52 Si, 0.27 C; density 516 lb ft ⁻³ .	X-40; 25, 5 Cr, 10, 6 NI, 7, 5 W, 2, 0 Fe, 0, 63 C.	W7-52; 20 22 Cr. 10-12 W, 1.50 2.0 Nb + Ta, 1.5 2.0 Fe, 1.0 max Ni, 0.5 max Mn, 0.50 max Sl, 0.04 max P, and 0.04 max B.	Same an above.	Same as above.	GE = X = 61; 25 Cr. 10 Nl. 5 Ms. 3 Fe. 0.5 Mn, 0.5 Sl. and 0.4 = 0.5 C.	HE 1049; 41, 6 Co, 26, 0 Cr, 15, 0 W, 10, 0 M, 3, 0 Fo, 0, 8 Mn,	• • • • • • • • • • • • • • • • • • •	
Ropt. Errar%	ਹ ੇ #		₹ ÷					ю У		
Fomp.	408 H2.H	203-107:	375828	47H-1360	388-1341	1401-280	6331-811	28.87 - C8.8.	_	
Rof.	1,10	22	61-3	g-09	00-U	9-09	0-00	2-19		<u>.</u>
E 3	0	0	4	Þ	⊽	O	Δ	•		

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THERMAL DIFFUSIVITY -- COBALT + CHROMIUM + XX

Temperature, oK

Teermal diffusivity, em³ Seर[ा]

THERMAL DIFFUSIVITY -- COBALT + CHRCMIUM + EXI

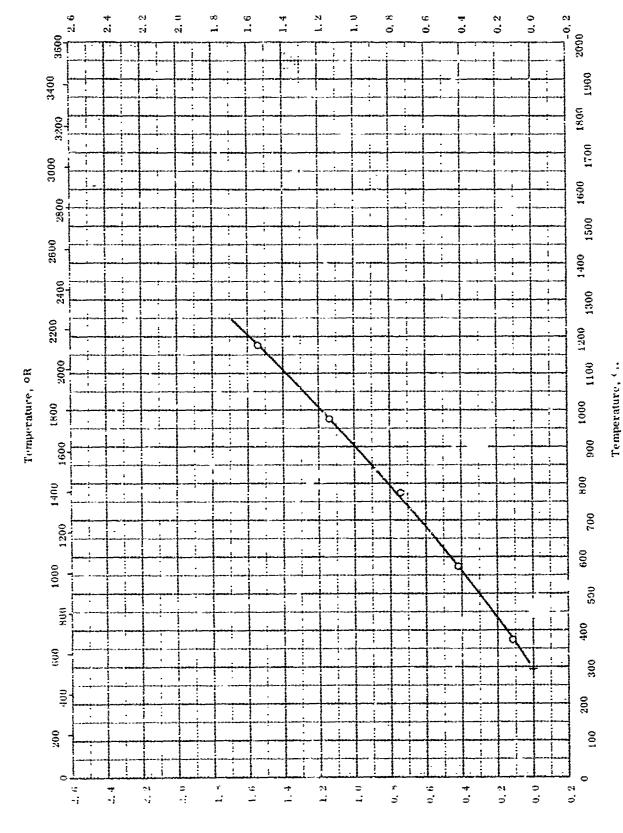
HEFFUSING B INFORMATION

Tomas Phil		
Ropt. Sample Specification	Hayness Skellike 25; 21.0 Cr. 3.0 Fe, 2.0 Mn, 1.0 Sl, and 6. 15C; approximate composition.	9-816; 20 Cr. 30 M, 4.0 Fe, 4,0 Mb, 4.0 W, 1.3 Mn, 0.4 Sl, and 0.04 C; composition from Mutal' a Handbeck.
Errar %	8 .0 v	6.4 St, and 6.64 C; composition from Metal's lianchook.
Lankschim	203-376	2114 - 922
Ref.	- 1 -2	명
53	0	C

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THERMAL LINEAU EXPANSION -- COBALT + CHROMIUM + Σx_1 (19, 1 Cr and 15, 64 Fe)



Thermal Linear Expansion, percent

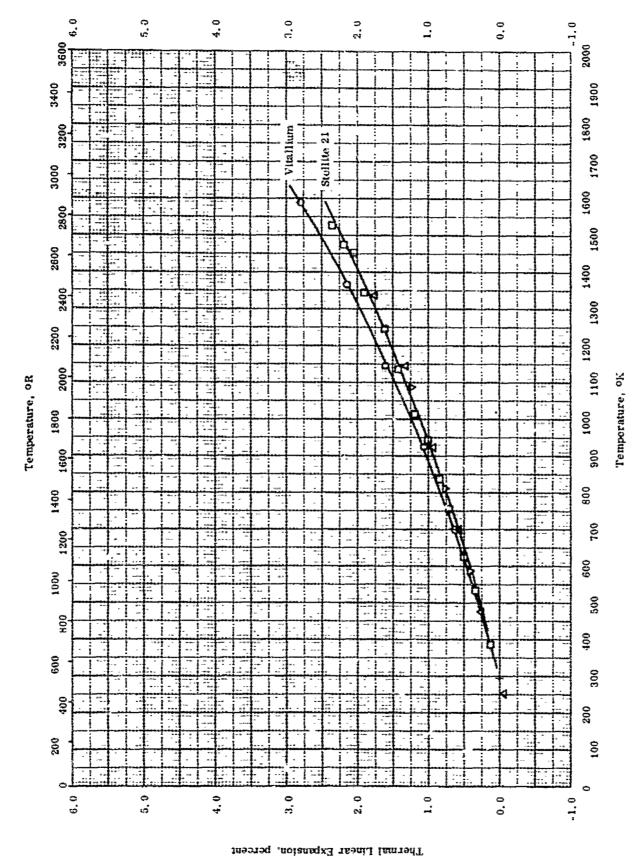
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THERMAL LINEAR EXPANSION -- COBALT + CHROMIUM + Σx_i (19. 1 CF and 15, 64 Fe)

PEFERENCE INFORMATION

Renarks	Enta given as appendix to paper presented at symposium.	•
Sample Specifications	Jessop G32 stæl (British design.); 46,6 Co, 19.1 Cr, 15.64 Fe, 10.5 Ni, 3.0 V, 2.2 Mo, 1.4 Nb, 0.77 Mn, 0.52 Si, and 0.27 C.	
Rept. Error %		
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itel.	252	
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THERMAL LINEAR EXPANSION -- COBALT +CPROMINM + ΣX_{\parallel} (25 - 30 Cr and 4 - 7 Mo)

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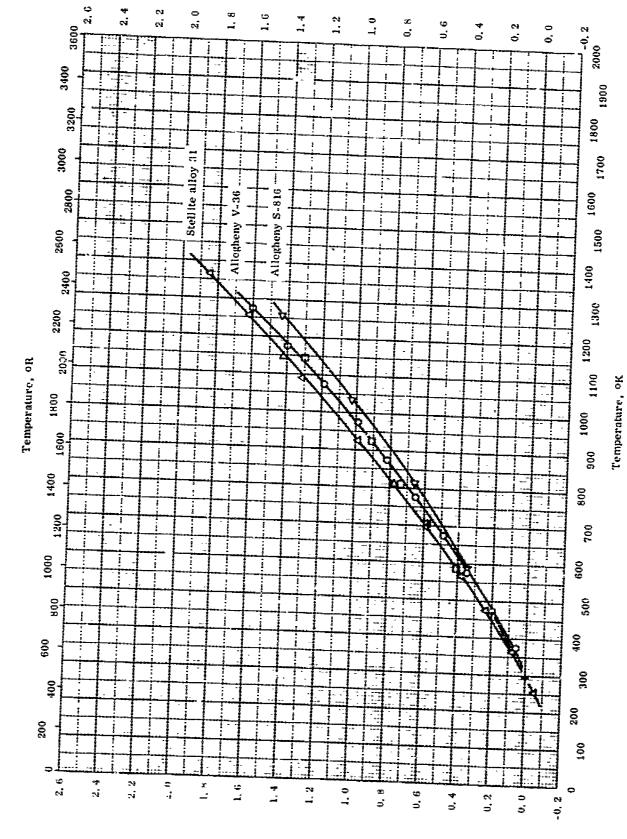
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THERMAL LINEAR EXPANSION -- COBALT +CHROMIUM + $\Sigma X_{\rm I}$ (25 - 30 Cr and 4 - 7 Mo)

7 .

Renarks	Heating rate of 200 F acc" 1.		Measures, at Batelle Mem, Inst. for NDRC.	Expansion test made on investment-cast bur.
Sample Specifications	Vitallium; 62.2 Co, 27.4 Cr, 5.5 Mo, 2.8 Ni, 0.7 Fe, 0.66 Mn, Heating rate of 200 F acc 1. 0.53 Si, and 0.22 C.	Stellite 21; 60.49 Co, 26,69 Cr, 5.42 Mo, 2,38 Ni, 1,64 Fe, and 0,258 C; after testing, material analyzed as 62,27 Co, 26,74 Cr, 5,42 Mo, 2,42 Ni, 1,23 Fe, and 0,264 C; donsity 511,2 is ff ⁻³ .	Stellita 21 (NDRC No. NR-10; AMS No. 5385); 25.0 - 30.0 Cr., 4, £ - 6.5 Mo, 1, 5 - 3, 5 M, 2, 0 max Fe, and 0, 20 - 0, 35 C; density 518 lb K ⁻³ .	Haynes Stellite alloy No. 21; 56, 94 - 63, 54 Co, 25, 50 - 29, 90 Cr, 5, 00 - 6, 00 Mo, 2, 00 Fe, 1, 75 - 3, 75 Mi, 1, 00 Mn, 1, 00 Si, 0.20 - 0, 30 C, 0, 007 B; density 8, 30 g cm ⁻³ , M. P. 1352 C, and electrical resistivity 87.4 microhm - cm at 24 C.
Rept. Error %				
Temp. Range OK	293-1589	300-1625	255-1332	2941059
Ref.	51-16	2 8.0	47-2 also 50-3	5827
Sym	0	0	4	D



THERMAL LINEAR EXPANSION -- COBALT \circ CHROMIUM + Σx_1 (19 - 29 CF and 9 - 21 NI)

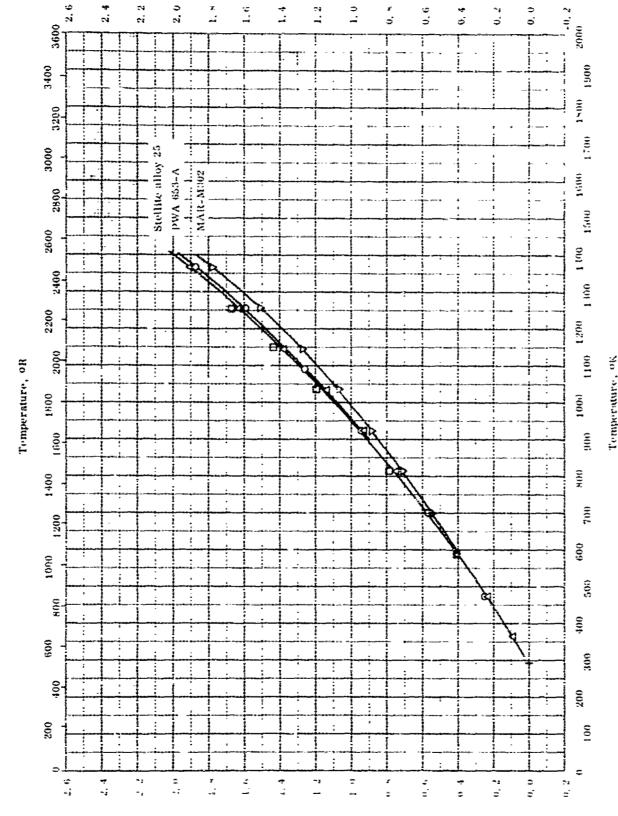
Thermai Linear Expansion, percent

S97

THERMAL LINEAR EXPANSION -- COBALT + CHROMIUM + ΣX_1 (19-29 Cr and 9-21 N)

REFERENCE INFORMATION

Remarks			nsion test made on investinent-cast kar.		
Sample Specifications	Haynes Stellite Alloy No. 30 (NRDC No. NR-12; AMS-5380); nondaal: 23 - 29 Cr. 13 - 17 Nl. 5 - 7 Mo. 2 max Fe. and 0,35 - 0,50 C.	Haynes Stellite Alloy No. 31 (NRIX: 3.00 NR71; AMS - 5362); nominal: 23 - 28 Cr. 9 - 12 Ni, 6 - 9 W, 2 max Fe, and 0, 15 - 0, 80 C.	Haynes Stellite Alloy No. 31; nominal: 40,45 - 54,55 Co, 24,5 - Expansion test made on investinent-east bar. 26,5 Cr, 9,5 - 11,5 Ni, 7,00 - 8,00 W, 2,00 Fe, 1,00 Mn, 1,00 Si, and 0,45 - 0,55 C; density 8,61 g cm ⁻³ .	Allegheny V.36; 42 Co, 25 Cr, 20 Ni, 4 Mo, 3 Fe, 2 Nb, 2 W, 1 Mn, 0,50 Si, and 0,30 C; M. P. 2350 - 2450 F.	Allogheny 8-816; 40 - 44 Co, 19 - 21 Cr, 19 - 21 N1, 5 Fe (mrx), 3,5 - 5 W, 3,5 - 4,5 Mo, 3,0 - 4,5 Nb + Ta, 1,8 max Mn, 0,9 max S1, and 0,32 - 0,42 C; density 0,313 lb in-3 and M.P. 2350 - 2450 F.
Rept. Error %					
Temp. Range ok	589.1145	256-1366	294-1144	294.1273	2931266
Ref.	S0-3	50-3	58-28	61-25	5326
Sym	0	٥	Δ	0	▽

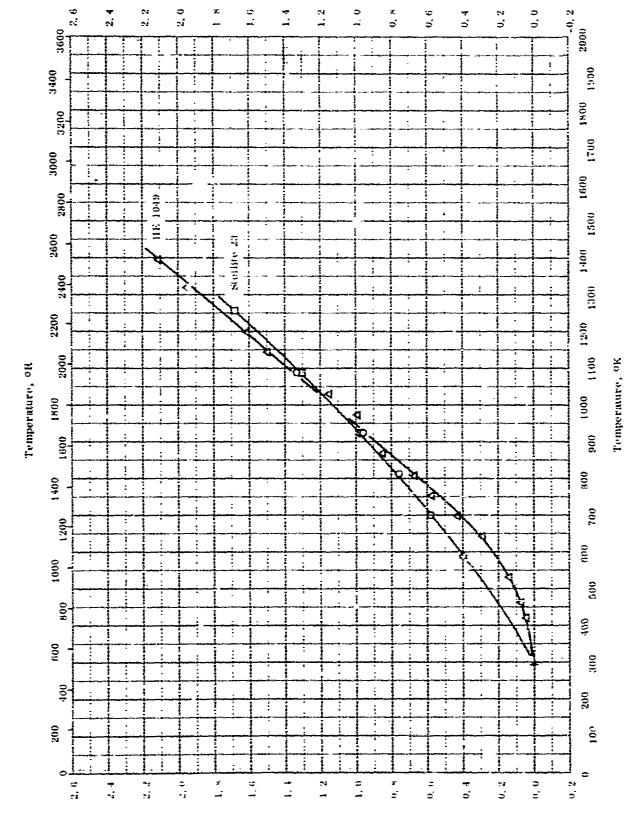


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THERMAL LINEAR EXPANSION -- COBALT + CHROMIUM + Σx_1 (10 - 23 CF and 9 - 16 W)

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Remainment in the control of the con		Annealed at 2225 F for 30 min and air-cooled,		AH CHKL,
SHIDDIG SHOCKLORE and the second seco	PWA 663 - A (Haynes 152); 20 - 22 Cr. 10 - 12 W, 1.5 - 2.5 Nb + Tn, 1.0 - 2.5 Fe, 1.0 max Ni, 0.50 max Si and Mn each, 0, 4 - 0.5 C, 0.04 max P, and 0.040 max S; nomical composition, density 0.321 lb in, "3 and melthig range 2400 - 2500 F.	Hautelley No. 25; 52 Co, 20 Cr, 15 W, 10 Ni, and 9, I C; normand composition; density 0, 313 lb in, "3	Haynes Alloy No. 25; 45, 85 - 52, 95 Co, 19 - 21, 0 Cr, 14 - 16, 0 W, 9, 0 - 11, 0 Ni, 3, 0 Fo, 1, 0 - 2, 0 Mn, 1, 0 Si, and 0.05 - 0, 15 C; density 9, 13 g cm ⁻³ and meliting range 1329 - 1410 C.	MAR-Mi02; former SM 302; 26 - 23.0 Cr. 9 - 11.0 W, 8 - 10 Ta, 1.5 max Fe, 0.78 - 0.93 C. 0.4 max Si, 0.1 - 0.3 Zr. 6.2 max Mn, and 0.010 mux B; density 0.333 lb in. "3 and melting range 2400 - 2450 F
Rept. Error "5				
Temp.	21K2, 17H7	264-1265	294-1366	280-1367
10.1.	2.09	5643	91 - 29	64-11
	0	G	4	D



THERMAL LINEAR EXPANSION ... CONALT (CHROMIUM + Σ_{N_1} (23...29 Cf. and 4...15 W)

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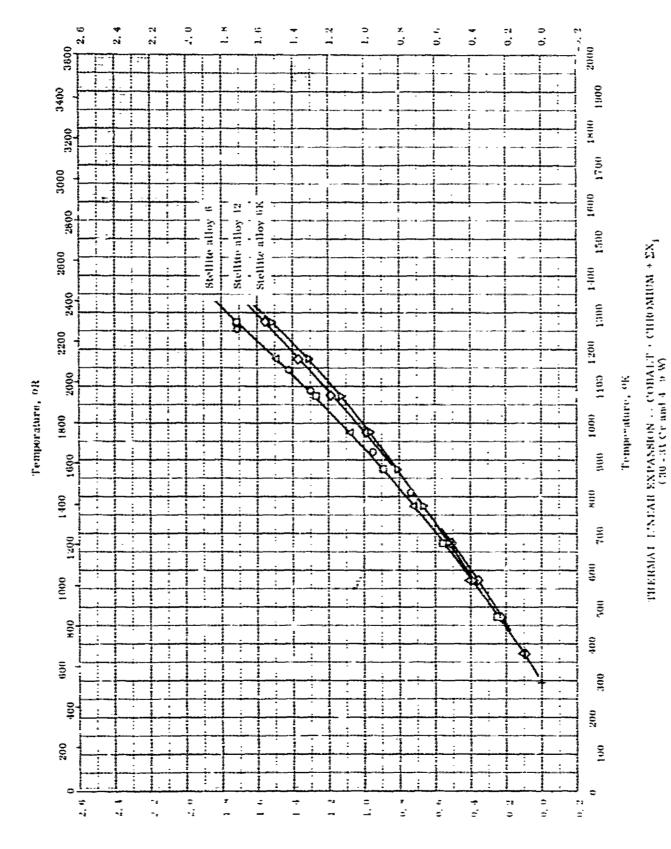
Dermit Linear Expensive percent

THERMAL LINEAR EXPANSION -- COBALT + CHROMIUM + ΣX_1 (23 - 29 Cr and 4 - 15 W)

RLFERL (C.E. INFORMATION

Remarks		As practiston cant; data entimated from a similar alloy.		
Sample Specifications	Stollite 23 (Ni Fo, 4,6 mm	Haynes HE 1049; 45 Co. 26 Cr., 15 W. 10 Ni, 0.4 B, and 0.4 C.	Ваупен Skellite H E 1049; 43, 6 Co. 26, 0 Cr. 15, 0 W, 10, 0 Mi. 3, 0 Fe, 0, 8 Si, 0, 8 Mn, 0, 40 C, and 0, 4 B; Genatry 8, 8B g em ⁻³ .	
L. Trong				
Tomp.	080**899	294-1255	100-1195	
Ref	30-3	64-43	Q 1 3	
	0	ח		

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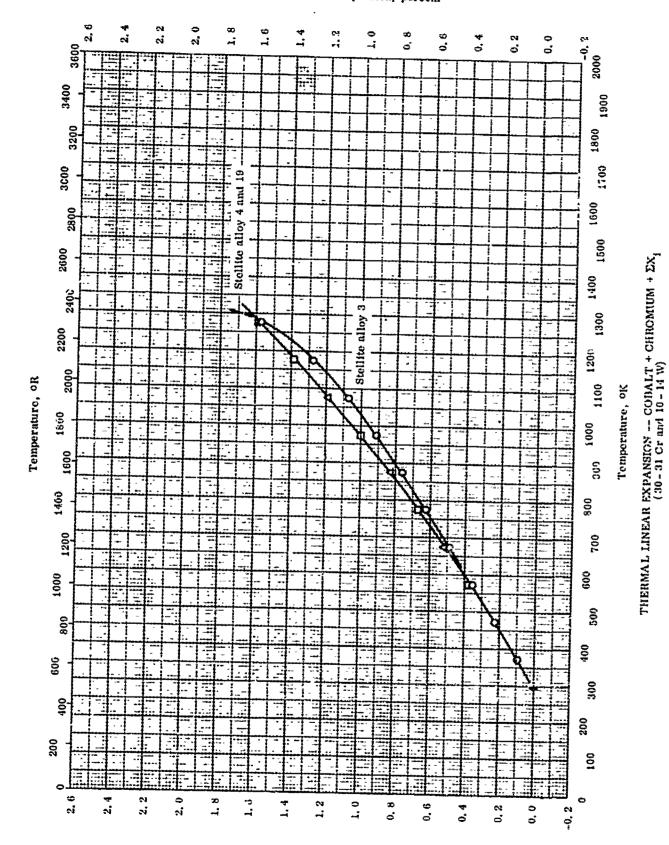
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THERMAL LINEAR EXPANSION ... COHALT + CHROMIUM + ΣX_1 (30..3) Cr and 4.0 W)

RUFFIRDNOL INFORMATION

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real faite the state of the sta	64 Co, 39 Cr, and 6 W: nominal composition; density 526 th tt	Haynes Statista Alloy No. 6, 54, 6 Co., 30 Cr., 4, 5 W., 3 Mt, 3 Fe, 1, 5 Mt, 1, 5 Mo, 1, 1 C, and 1 kin; nominal composition; density 8, 38 g cm ⁻² and melting point 1275 C.	Haynen Stellt Altoy No. 6 B. 62.9 Co. 30 Cr. 4.6 W. 3 Ni. 3 Pe. 2 3. 7 No. 1.6 Mo. ard 1.1 C; denaty 8.38 g om" 1 and metting range 1266 - 1364 C.	Haymus Rellike Alloy No. 6 K; 61.4 Co. 31 Cr. 4.5 W, 3 Nl. 3 F. 7 F., 2 St. 2 Mu, 1.6 C. and 1.5 Moi density 5.38 g cm ⁻³ and melling range 1281 - 1306 C.	Inynan Stellita Altoy No. 12; 56, 55 Cc. 30, 5 Cr. 4, 5 W. 3 Mt. 3 Fe, 1, 35 C. 1 M, 1 Mn, and 1, 6 othern; nombal composition; dennity 8, 52 g cm ⁻³ and molting point 1263 C.	
Lent.						
Lana Pr	293-1286	2731-1273	273-1273	173-1273	874-1870	
	62	02.20	92~20	62-20	02-20	
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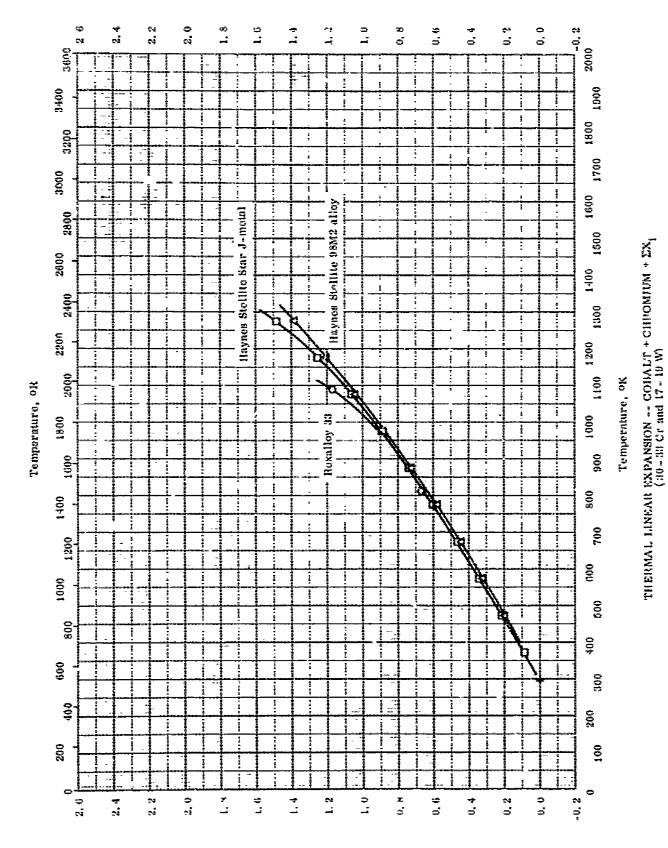


Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- COBALT + CHROMIUM + Σx_1 (36-31 CF and 10-14 W)

RAMATATAS				
Sample Specifications	Haynes Stallitu Alloy No. 3, 45,55 Co. 30.5 Cr. 12.5 W, 3 Ni. 3 Fe, 1 Mn, 1 Si, and 1.0 others; nominal composition; density 8,64 g om ⁻³ and me'ting range 1235 - 1329 C.	Haynos Stellite Alloy No. 4; 45.0 Co, 30 Cr, 14 W, 3 M, 3 Fo, 1.6 Si, 1, 5 Mo, 1.0 Mn, and 1, 0 C; nominal composition; density 8, 79 g cm ⁻³ and melting range 1247 - 1356 C.	Haynes Stollike Alloy No. 19; 46, 8 Co, 31 Cr, 10, 5 W, 3 Ni, 3 Fo, 1, 7 C, 1 Si, 1 Mn, and 1, 0 cthors; nominal composition; density 8, 36 g cm ⁻³ and melting range 1256 - 1298 C.	
Ropt. Error%				
Temp. Range ^o K	273.1273	273-1273	293-1273	
Ref.	62-25	62-26	62-28	
\$0 80 80 80 80 80 80 80 80 80 80 80 80 80	0	D	4	



Thermal Linear Expansion, percent

997

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THERMAL LINEAR EXPANSION -- COBALT + CHRONIUM + Σx_1 (30 - 33 Cr and 17 - 19 W)

Sample of the second second second second second second second second second second second second second second	Rexulloy 33; 44 Ce, 33 Cr, 17 W, 2, 0, 76 Sl; demity 0, 317 lb in. 3 and my	Haynos Stellite Star J-metal; 39 Co., 32 Cr., 17 W, 3 Fe, 2.4 C., 2.6 Ni, 1.0 Si, 1.0 Mn, and 2.0 others; nominal composition; density 8,76 g cm ⁻³ and melting 1106 - 1332 C.	Haynes Stellitts 98 M2 Alloy: 34.7 Co, 30 Cr. 18.5 W, 4 V, 3.6 Ni, 2.5 Fe, 2.0 C, 1.0 St, 2.0 Mn, 0.8 Mo, and 2.0 others; density 8.03 g cm ⁻³ and melting range 1139 - 1314 C.			
Ropt.					,	
Temp.	302 1089	2724-272	200-1270	 	 	
P.o.f.	64-32	62-26	02-30			
Sym Bod	0	D	∢			

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Hemispherical Total Emitance

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HEMISPHERICAL TOTAL EMITTANCE ... COBALT + CHROMIUM + EN

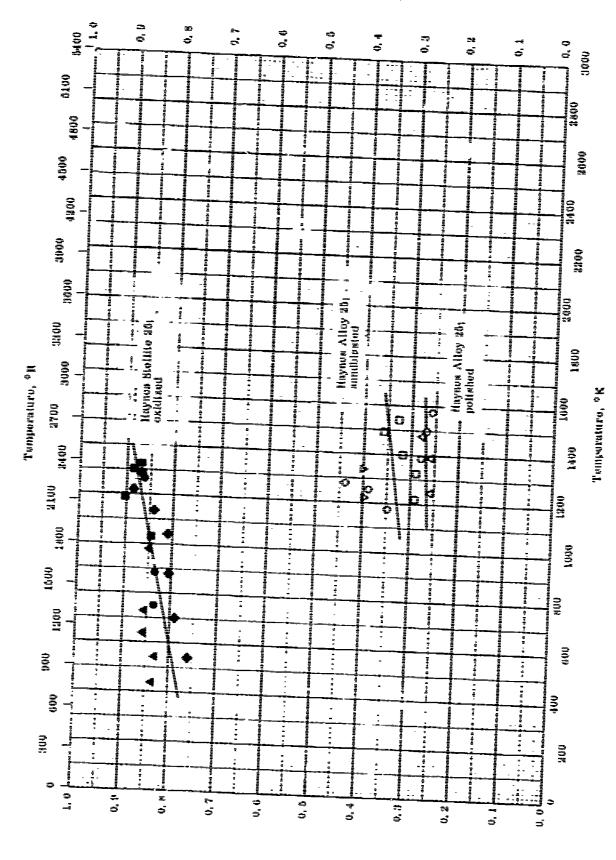
Temperature, ok

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Hemispherical Total emittance -- Codalt + Chronium - Ex

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Terres de la faction de la fac	Haynon alloy No. 25; nominal; 10 - 21 Cr., 14 - 16 W. 0 - 11 M; 3 max, F5, 1 - 2 Mn, 9, 05 - 0, 15 C, 0, 04 max, P, 1 max, 81, 0, 03 max, 8,
Kept.	
Tang.	\$80-1366
14¢ f.	20-17
	0

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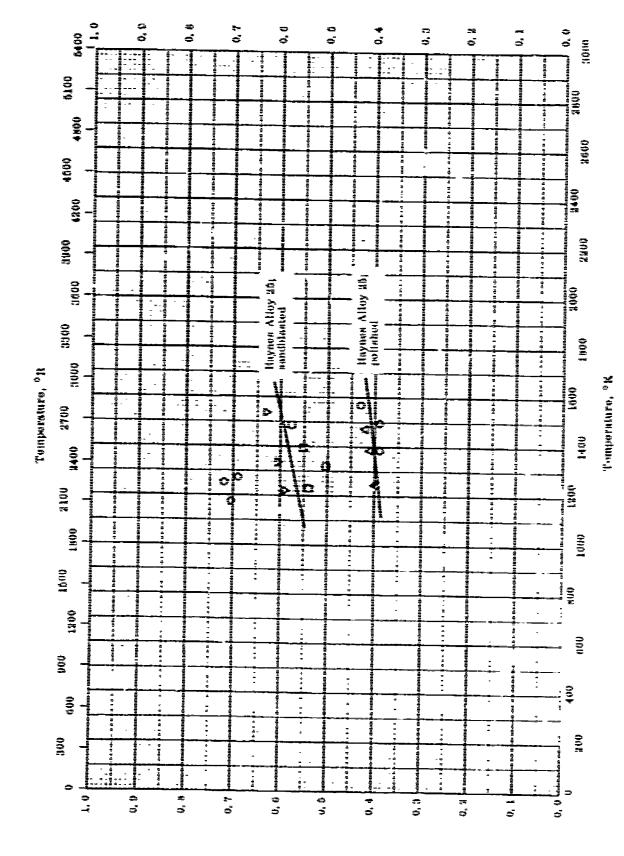
NORMAL TOTAL EMPTRANCE -- COUALT + CHROMIUM + EX

sarning led) temo?

NORMAL TOTAL EMPTANCE -- COUALT + CHROMIUM +EX

инсритентина применентинентиний одрагия применентинентинентинентинентинентинентине	Pollshodi menanred in vacanın (34 µ Ug) i beat- ing.	The above apecimen, cooling.	Gabablinteds measured in vacuum of il 4 µ Hg; heating.	The above aperimen, couling.	Cleaned in 1 to 1 water-dibuted HF solution for L hri exilized 3 bre at 1266 K in afr, measured in Decreasing lemperatures.	The above aprofact areasured in degreealing teamperature.	Obsumed in 1 to 2 water, differed HF solution for 1 hrs exidized 3 hrs at 1500 K in ally messaured in thereafing temperatures,	The abuve spectimen menomered to decreasing
риториятивие вистемительной при в при при в при при в при при при при при при при при при при	Hayare alloy 20 (L-005), nominal 19-21 Cr. 14-16 W, 9-11 NI, 9 max, Pe, 1-2 Ma, 0,00 - 0,16 C, 0,04 max, P, 1 max, Bland 0, 8 aurfle venumber 0,7 - 1,6 m mm.	Name in those,	Hayann alloy 25 (L-605) ; nurface roughness 70 - 60 μ RMS.	firms as above.	Haynov Shellite 26 f 1886178); surface coughness: (an recoived) fine atructure 2,5 microns, course atructure 6 microsov at 200 microsov intervals and (fully aged) fine structure 2,5 microsov, courses structure 1 microsov at 2000 microsov microsovis.	Bitting an indicate,	lama as above, (teerdeed from bound).	40-30 3-10-1211 Anny apenture of the contract
Krear &								
	1177-1572	124th 1477	1222-1533	Manager 1998	746.1227	43 to 10 845	101D. 111.	0-10- kg H
X (*) () () () () () () () () ()	18-09	011-23	18-80 -80	03-81	1E-00	98-99	00-10	0.600
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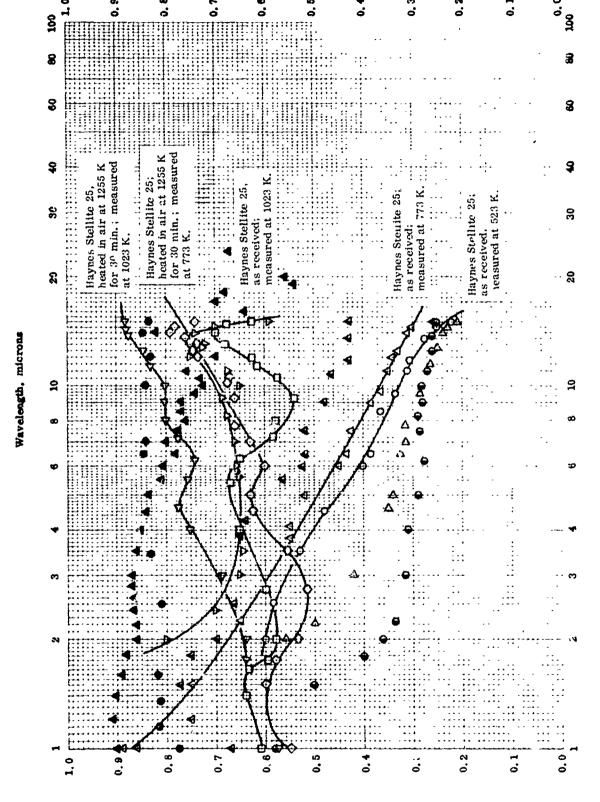
NOBALA ENPECTIVAL EMPTANCIC — COBLAT + CHROMIUM + BM

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ROHMAL MUSTRAL EMPTTAMEE COBALT CHROMIUM CS.

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Normal Spectral Emittance

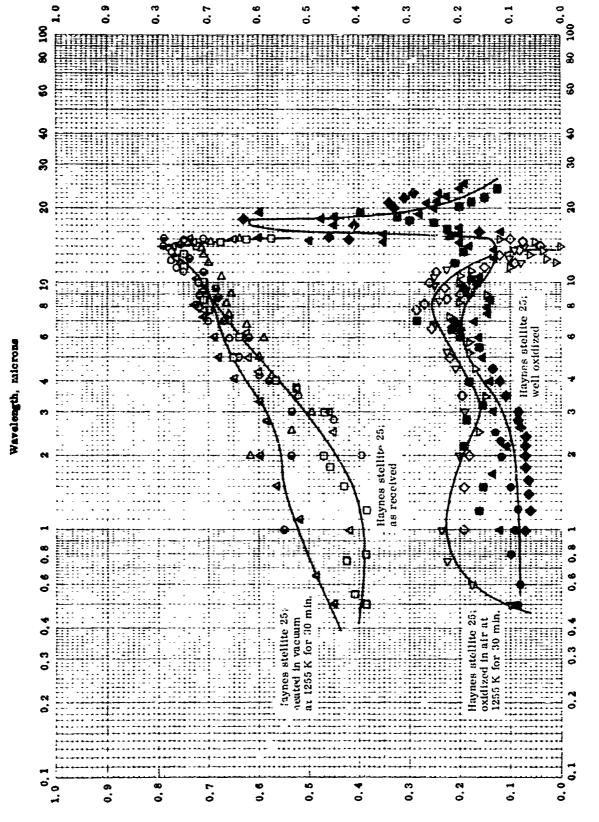
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NORMAL SPECTRAL EMITTANCE -- COBALT + CHROMIUM + ZN

Wavelength, microns

NORMA'S SPECTRAL EMITTANCE -- COLALT + CHROMIUM + ΣX_1

Remarks	As received.	As received.	As received.	Heated in air at 1255 K for 36 min.	Heated in air at 1255 K for 30 min.	Heated in air at 1255 K for 30 min.	Heated in a 7, 6× 10 ⁻⁵ mm lig vacuum at 1255 K for 30 min.	Same treatment as above.	Same treatment as above.	Cleaned in 1 to 1 water-diluted HF solution for 1 hr; oxidized 3 hrs at 1200 K in air.	Well sidized.	
Sample Specifications	Haynes Stellite 2f; nominal: 19-21 Cr, 14-16 W, 9-11 Ni, 3 max. Fe, 1-2 Mn, 0.05-0.15 C, 0.04 max. P, 1 max. Si, 0.03 max. S; commercial.	Same as above.	Same as above.	Haynes Stellite 25; commercial.	Same as above.	Same ан above.	Haynes Stellite 25; commercial.	Same as above.	Same as above.	HS-25 (SSS178); surface roughness: fine structure 2.5 μ , coarse structure 1 μ in 2500 μ intervals.	HS-25.	
Rept.												
Wavelength Range, µ	9	1, 00-15, 00	1, 00-15, 00	2, 00-15, 00	L. 00-15, 00	1. 00-15. 00	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	1. 00-15. 00	1. 09-23, 50	
Temp. OK	523. 2	773.2	1023	523. 2	773.2	1023	523. 2	773.2	1023	1033. 2	1027.6	
Ref.	62-19	62-19	62-19	67-29	62-19	62-19	62-19	62-19	67-19	60-20	62-23	
Sym	0	٥	ם	D	◊	∇	Δ	•	4	•	4	



Normal Spectral Reflectance

TPRC

NORMAL SPECTIAL REFLECTANCE -- COBALT + CHROMIUM + ΣX_{i}

NURMAL SPECTRA, REFLECTANCE -- COBALT + CHROMIUM + EXI

			-																	
Kemarks	As received: 523, 2 K source.		Time ally the soundance and the soil	and make specified with (13, 2 K source,	The above specimen with 1273 K source,	licated in air at 1255 K for 30 min.,	523, 2 A source.	The above specimen with 773, 2 K source.	The above specimen with 1273 K source	Heated in a 7.6 × 10 ⁻⁵ mm Hg vacuum at	1255 K for 30 min., 523, 2 K source,	The above sixclinen with 77:1 9 K amen.	The above the state of the stat	Cleaned in 16 1 water, attached in 2015	for 1 hr; oxidized 2 hrs at 1200 K in av-	Cleaned in 1 to 1 water-diluted are solution	for 1 hr: oxidized 3 hrs. at 1200 K m. etc.	The above are described in the state of T	Well oxidized.	
Sample Specifications	Commercial Haynes Stellite 25; nominal; Bal. Co,	19-21 Cr, 14-16 W, 5-11 Ni, 3 max, Fe, 1-2 Mn, 0.05-0.15 C, 0.04 max, P, 1 max, Si, 0.03 max, s	Same as above.	Same as above,	Communical Horans Statte, or	commercial traylacs atended 20,		Same as above.	Same as above,	Commercial Haynes Stellite 25.		Same as above,	Same as above.	118-25 (SS4178); surface roughness: 1ino structure 2, 511.	coarse structure 1 µ in 2500 µ intervals.	HS-25 (SS8178); surface roughness; fine structure 2, 5 u,	coarse structure 1 p in 2500 p intervals,	Same as above,	HS-25,	
Rept.									<u> </u>			<u> </u>		=	-			- SS	=	
Range, H	2, 00-15, 00		1, 00-15, 00	0, 50-15, 00	2, 00-15, 00			1, 00-15, 00	0, 50-15, 00	2, 00-15, 00		1, 00-15, 00	0. 50-15. 00	0. 5-2. 5		1. 0-25, 0		1, 20-24, 0	1, 00-23, 00	
Temp. °K	· 322		< 322	< 322	. 322			322	. 322	× 322		323	. 322	294		294		825. 4	294	
Rof.	62-19		62-19	62-19	62-19		;	67-29	62-19	67 29	6	67-29	62-19	60-20		60-20		60-20	62-22	
ροι	0	-	4	0	D			>	▽	Δ			4	•						

REPORTED VALUES

Molti	ing Point:	К	R
0	30 Cu and 10 Pd	1389	2500
	40 Cu and 10 Pd	1389	2500
Δ	30 Cu and 20 Pd	1396	2513
∇	40 Cu and 20 Pd	1415	2547
Δ	30 Cu and 30 Dd	1118	2553

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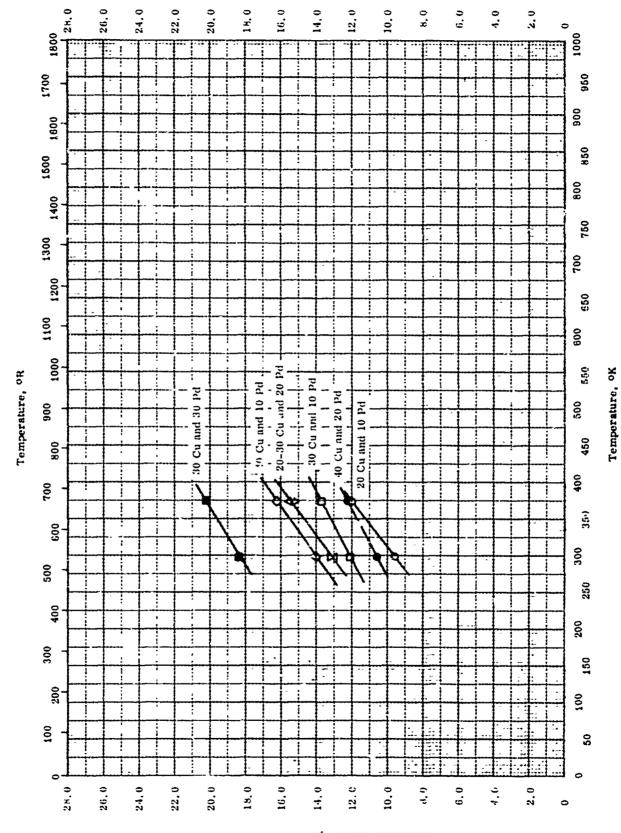
PROPERTIES OF COBALT +COPPER + EX

REFERSNCE INFORMATION

	<u> </u>					
Remarks	M.P. by breaking time-temperature curve during cooling.	Same as above,	Same as above,	Same as above.	Same as above,	
Sample Specifications	60 Co. 30 Cu, and 10 Pd; from electrolytic Cu and Co with 0.01 > C.	50 Co, 40 Cu, and to Pd; same as above.	50 Cs., 30 Cu, and 20 Pd; same as above.	40 Co, 40 Cu, and 20 Pd; same as above.	40 Co, 30 Cu, and 30 Pd; same as above.	
Rept. Error®						
Temp. Range OK	1389	1389	9681	1415	1418	
٦٠٠.	56-24	56-24	56-24	56-24	56-24	
Sy.in Fool	٥	0	7	D	0	

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Electrical Resistivity, ohm cm $x\ 10^4$

-3⁴

electrical resistivity -- corall \cdot copper \cdot Σ_{k}

Remarks	Annealed 150 hrs at 1000 C in vacuum and cooked in 10 hrs.	Same as above.	Same ан abov e.	Same as above.	Same as above.	Same as above.	Same as above.				
Sample Specifications	70 Co. 20 Cu, and 10 Pd.	60 Co, 30 Cu, and 10 Pd.	60 Co, 20 Cu, and 20 Pd,	50 Co, 40 Cu, and 10 Pd.	50 Co, 30 Cu, and 20 Pd.	40 Co, 40 Cu, and 20 Pd.	40 Co, 30 Cu, and 30 Pd.				
Rept. Ervor %											
Temp. Range OK	298-373	298-373	298-373	298-373	298-373	020-867	298 373		 	 	
Ref.	56-24	56-24	56-24	56-24	56-24	56-24	26-24				
Sym	٥	0	٥	\$	D	•		 	 	 	

Properties of cobalt -cold - $\mathbb{S}N_i$

REPORTED VALUES

Melti	ing Point:	К	R
0	20 Au and 10 Pd	1333	2400
	30 Au and 10 Pd	1323	2352
Δ	20.3 Au and 20.2 Pd	1402	2524
⊽	40 Au and 10 Pd	1313	2373
<	30 Au and 20 Pd	1372	2470
>	40 Au and 20 Pd	1463	2634
\Diamond	30 Au and 30 Pd	1463	2634

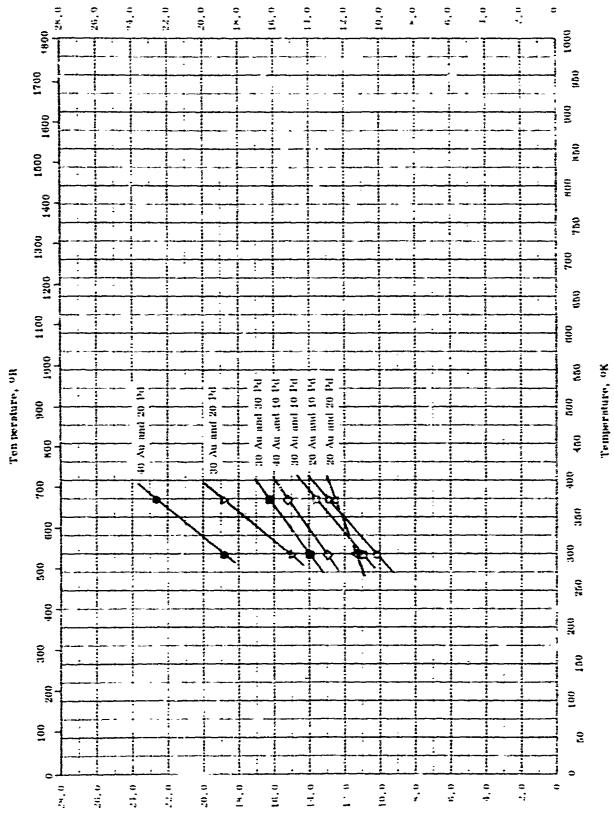
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PROPERTIES OF CODALT + GOLD + EN

REFLEINCE INFORMATION

Remarks	Amented in vacuum 100-150 her close to solidus temperature and slowly cooled.	Same as above.	Same an above.	Srme ан above,	Same ин above.	Same an above.	Sume an above.	
Sample Specifications	70 Co, 20 Au, and 10 Pd; ingredients with · 0.01 imparities.	60 Со, 30 Ли, and 10 Рd; вате ав above.	59.5 Со. 20.3 Ац. 20.2 Рd; ните ав аботе.	50 Со, 40 Ли, and 16 Рd; наше ин приус.	50 Co, 30 Au, and 20 Pd; same as above.	40 Co, 40 Au, and 20 Pu; name an above.	40 Со, 30 Ац, and 30 Рd; кате ин абоуе.	
Trrot.								
Rung.	1333	1323	1-102	1318	1372	12453	1-16.3	
Ke I.	56-25	26-25	26-25	56-25	56-25	26-25	56-25	
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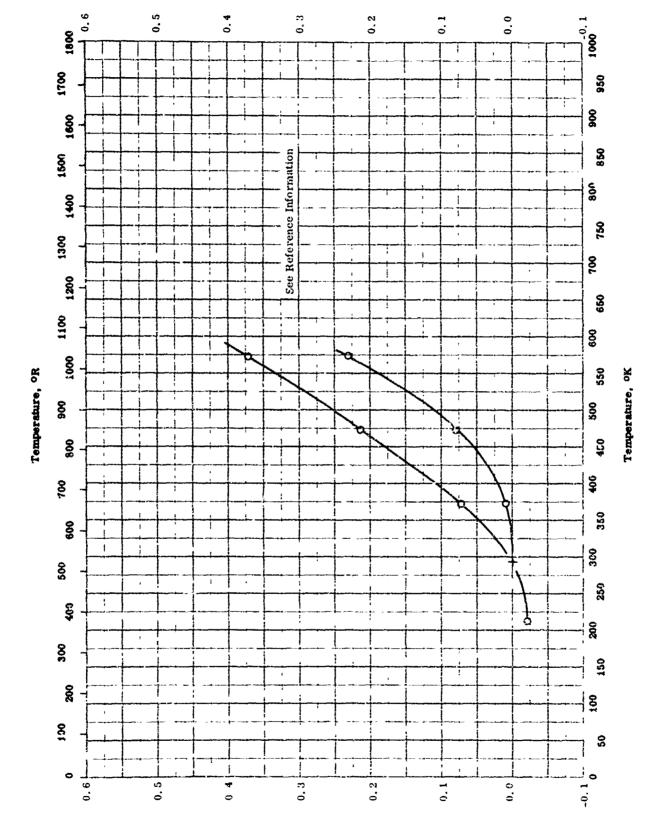


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THERMAL LINEAR EXPANSION -- COBALT + TRON + Σ_1 (36 - 37 Fe and 8, 5 - 9, 9 Cr)

Thermal Linear Expansion, percent

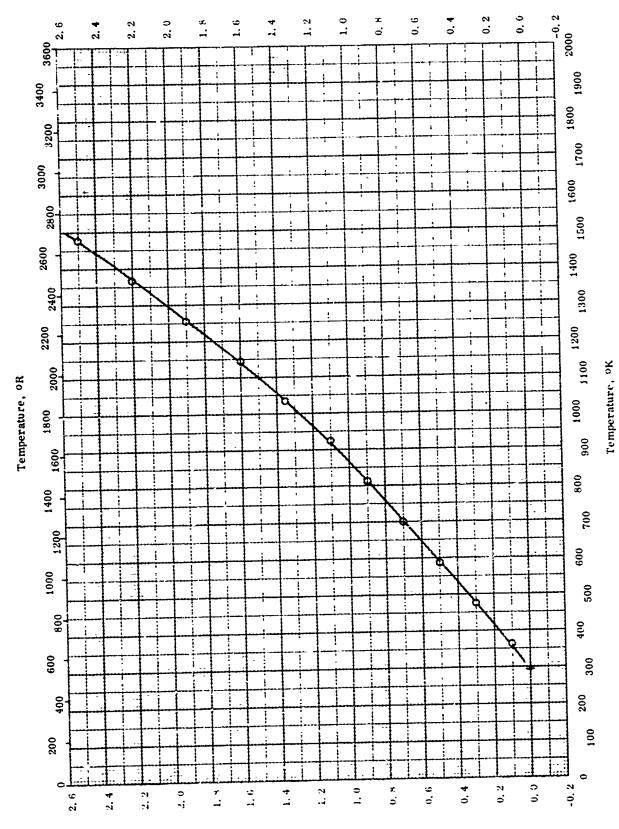
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THERMAL LINEAR EXPANSION -- COBALT +IRON + ΣX_1 (36-37 Fe and 8.5-9.9 Ct)

REFERENCE INFORMATION

Remarks	il, annealed 1 hr at 1000 C and furnace-cooled over 20 hrs; expansion extremes are plotted; author gives detailed data for materials within given composition range.	
Sample Specifications	19 sublitzed samples: between 53, 1 - 54, 32 Co, 36, 22 - 37, 2 Fe, 8, 56 - 9, 87 Cr, < 0, 33 Si, < 0, 11 C, and < 0, 10 Mn; α and/or γ phase.	
Rept. Error %		
Teinp. Range ^O K		
Ref.	55-37	
Sym	0	



THERMAL LINEAL EXPANSION -- COBALT + IRON + ΣX_1 (23, 25 Fc and 21, 0 Cr)

Thermal Linear Expansion, percent

March.

THERMAL LINEAR EXPANSION -- COBALT + IRON + ΣX_1 (23, 25 Fe and 21, 0 Cr)

REFURENCE INFORMATION

Remarks	Heating rate: 200 F sec ¹ .
Sample Specifications	30. 2 Co, 23. 25 Fe, 21. 0 Cr, 20, 5 Mi, 2. 43 Mo, 1. 67 Mn, 0. 17 C, and 0. 119 M.
Rept. Error %	
Temp. Range ok	293-1478
Ref.	61-16
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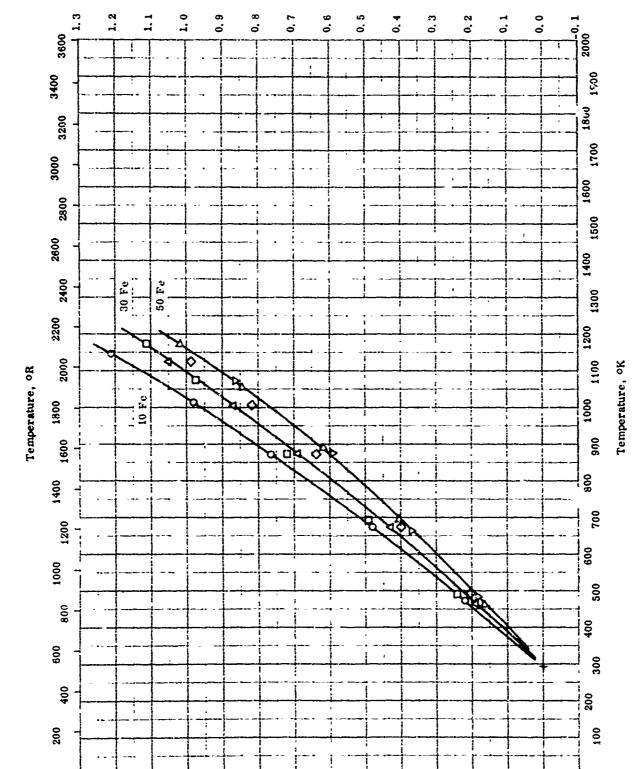
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THERMAL LINEAR EXPANSION -- COBALT + IRON + ΣX_1 (9 < Fe < 50)

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Thermal Linear Expansion, percent

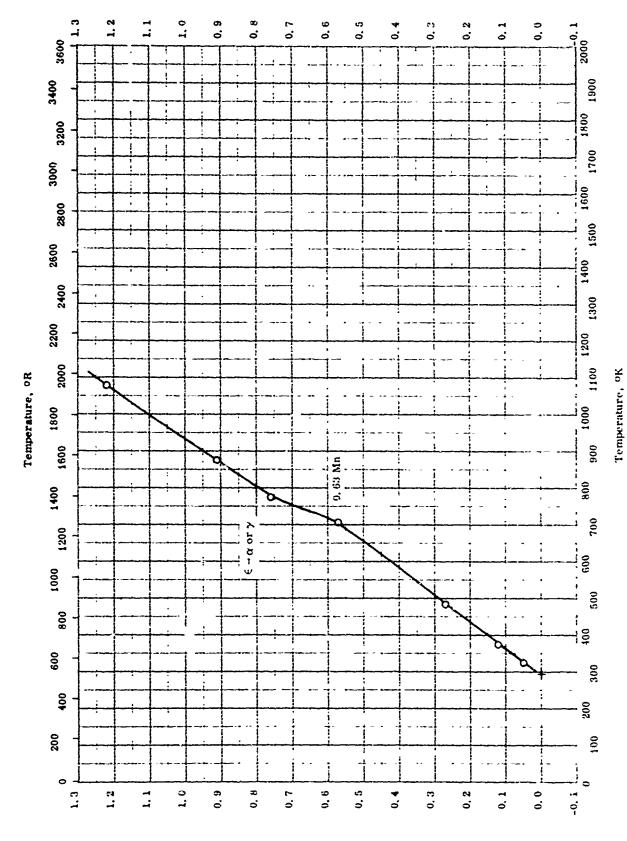
THERMAL LINEAR EXPANSION -- COBALT + IRON + Σx_1 (9 < Fe < 50)

REFERENCE INFORMATION

Remarks	Induction melted in vacuum from Armeo iron and cobalt rondelles, swaged, annealed 1 hr at 900 C in H ₂ and cooled slowly; heating rate = 200 C hr ⁻¹ .	Same as above.	Same as above.	Same as above.	Prepared from electrolytic Fe and Co; same heat treatment as above.	Prepared from Armco iron and cobalt rondelles; same heat treatment as above.
Sample Specifications	89. 6 Co by diff., 9.6 Fe, 0.63 Mn, and 0.03 St.	79. 4 Co, 20. 2 Fe, 0. 48 Mn, and 0. 01 St,	69, 6 Co, 29, 8 Fe, 0, 39 Mn, and 0, 01 > Si.	59. 8 Co. 39. 4 Fc. 0.58 Mn, and 0.01 > St.	52, 1 Co, 47, 39 Fe by diff. and 0, 01 Ni.	50. i Co, 49.2 Fe, 0.47 Mn, and 0.01 > Si.
Rept.	_					
Temp.	373-1148	373-1173	373-1123	373-1123	373-1073	373-1173
Ref.	48-9	48-9	46-9	48-9	48-9	4 N-9
Sym	0	٥	٥	\$	D	Δ

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Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- COBALT + MANGANESE + ΣX_1

REFERENCE INFORMATION

Remarks	Induction melted in vacuum, swaged, annealed 1 hr at 900 C in hydrogen, and cooled slowly; prepared from Armeo iron and coluil rondelles.
Sumple 'Pecuticutions	98. 9 Co (by diff.), 0. 63 Mn, 0. 2 C, 0. 1 Fe, and 6. 09 St.
Rept.	
Temp. Range og	«
Ref.	48-9
Sym	0

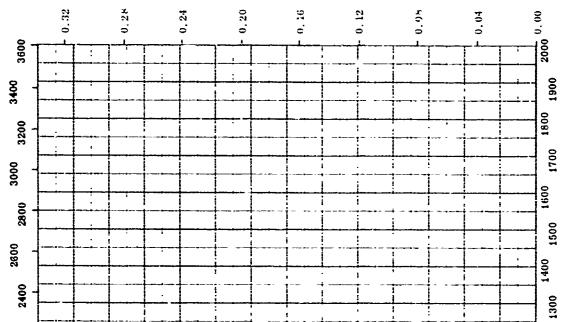
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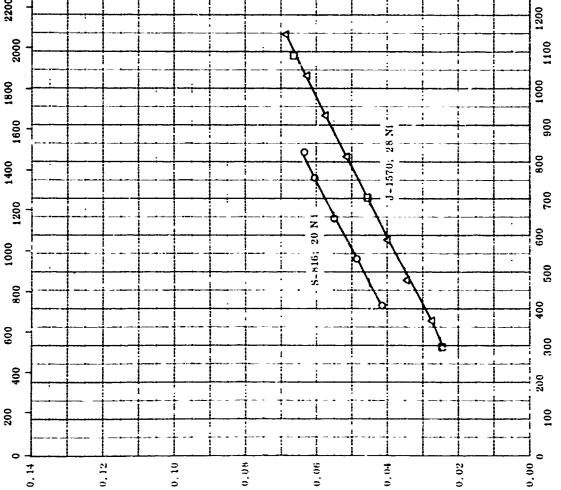
0.10

Temperature, oR



Temperature, ok

THERMAL CONDUCTIVITY -- COBALT + NICKEL + Σx_1



Thermal Conductivity, cal $\operatorname{Sec}^{-1}\operatorname{cm}^{-1}K^{-1}$

1.0.0

0.03

0.08

THERMAL CONDUCTIVITY --- COBALL + NICKEL + Σx_i

REFERENCE INFORMATION

Remarks									
Sample Specifications	S-816; 45, 0 Co, 20, 0 Ni, 20, 0 Cr, and 15, 0 Fe.	J. 1570 · 2 · NI, 20 Cr. 7 W, 4 Ti, 2 Fe, and 0, 2 C.	J1570; sarae as above.						
Rept. Error %				 		 	 	 	
Temp. Range ok		294 - 10 ±9	366.1144						
Ref.	51-3	5710	58-12		- 	 	 		
E S	0	<u>с</u>	٥			 	 	 	

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THERMAL DIFFUSIVITY -- CONALT ANCKEL ANG

Temperature, ox

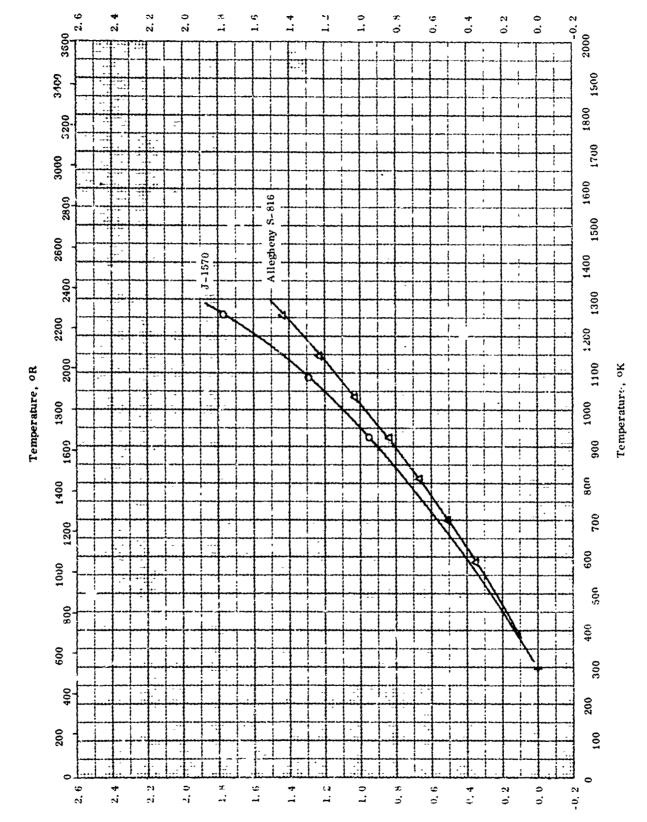
Thermal diffusivity, cm² Sec⁻¹

THERMAL DIFFUSIVITY ... COBALT (NIC. EL (EN)

REFERENCE INFORMATION

Ramarkn		
Sample Specifications	8-816; 20 Ni, 20 Cr, 4.0 Fe, 4.0 Mo, 4.0 Nb, 4.0 W. 1.20 Mb, 0.4 Si, and 0.04 C; composition from Metal's Handbook.	
Rept.		
Temp, Range SK	204 -927	
Ref	24-2	
E 7	0	

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THERMAL LINEAR EXPANSION -- COBALT + NICKEL + Σx_i

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- COBALT +NICKEL + Σx_1

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REFERENCE INIORMATION

Remarks	Solution-treated at 2150 F for 4 hrs, air-cooled, and then heat-treated at 1650 F for 24 hrs.	
Sample Specifications	J-1570; nominal: 39 Cc. 30 Ni, 20 Cr, 6.5 W, 4 Tt, and 0.2 C. Solution-treated at 2150 F for 4 hrs, air-cooled, and then heat-treated at 1650 F for 24 hrs.	Allegheny S-816; nominal: 40 44 Co, 19 - 21 Ni, 19 - 21 Cr, 5 max Fe, 3.5 - 5 W, 3.5 - 4.5 Mo, 3.5 - 4.5 Nb + Ta, 1.8 max Mn, 0.9 max Si, and 0.32 - 0.42 C; density 0.313 lb in3 and M. P. 2350 - 2450 F.
Rept. Error %		
Temp. Range ^O K	294-1255	294-1255
Ref.	56-43	52-20
Sym	0	4

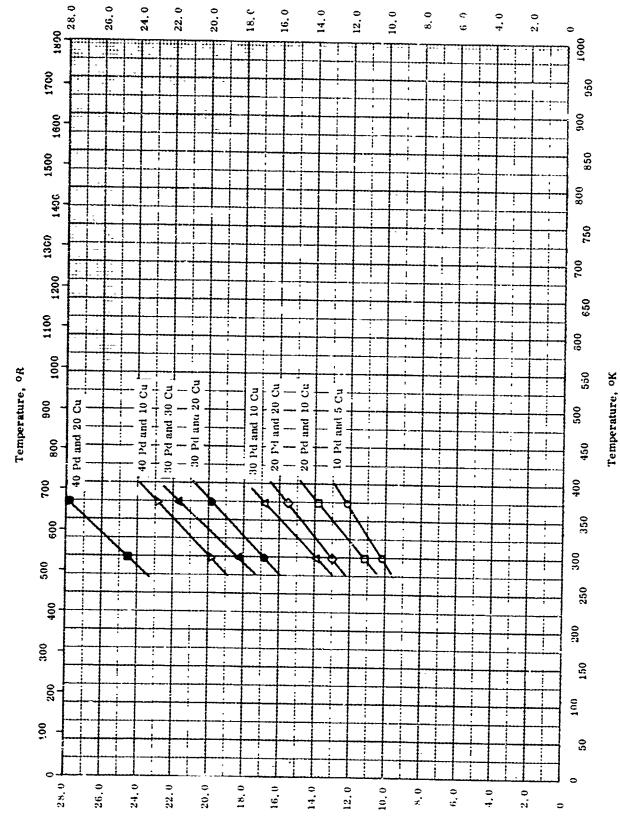
REPORTED VALUES

Melt	ing Point:	K	R
0	40 Pd and 10 Cu	1426	2567
0	30 Pd and 30 Cu	1415	2553
Δ	10 Pd and 2 Au	1675	3015
⊽	10 Pd and 8, 2 Au	1361	2450
4	20 Pd and 5, 2 Au	1553	2796
D	20.1 Pd and 10.3 Au	1436	2555
\Diamond	30.2 Pd and 5.2 Au	1565	2817
•	30 Pd and 10 Au	1535	2763
	40,1 Pd and 5,3 Au	1531	2756
•	30 Pd and 20 Au	1466	2639
•	46.1 Pd and 10.2 Au	1514	2725
4	40.3 Pd and 15.2 Au	1493	2688
•	40.0 Pd and 20.0 Au	1463	2634
•	30 Pd and 30 Au	1463	2634

PROPERTIES OF COBALT + PALLADITM + $\Sigma \mathbf{X_{i}}$

REFURENCE INFORMATION

Remarks	M.P. from break in time-temperature curve.	Same as above.	Annealed in vacuum 100-150 hrs close to solidus temperature and slowly cooled; M. P. same as above.	Same as above,	Same as above.	Same as above.	Same as above,	Same as above.	Same as above,	Same as above.	Same as above,	Same as Phove.	Same as above.	Same as above,		
Sample Specifications	50 Co, 40 Pd, and 10 Cu.	40 Co, 30 Pd, and 30 Cu.	88 Co, 10 Pd, and 2.0 Au.	81.8 Co, 10 Pd, and 8.2 Au.	74.8 Co, 20 Pd, and 5.2 Au.	69,6 Co, 20.1 Pd, and 10.3 Au.	64.6 Co, 30.2 Pd, and 5.2 Au.	60 Co, 30 Pd, and 10 Au.	54.6 Co, 40.1 Pd, and 5.3 Au.	50 Co, 30 Pd, and 20 Au.	49.7 Cc., 40.1 Pd, and 10.2 Au.	44.5 Co, 40.3 Pd, and 15.2 Au.	40 Co, 40 Pd, and 20 Au.	46 Co, 36 Pd, and 30 AJ.		
Rept.																
Temp, Range 'K	1426	1418	1675	1361	1553	1.436	1565	1535	1531	1466	1514	1493	1463	1463		
Ret.	56-24	56-24	56-25	56-25	56-25	26-25	56-25	56-25	56-25	56-25	56-25	56-25	56-25	56~25		
Sym	0	0	◁	٥	V	Δ	\(\)	•		4	>	•	A	•	 	



ELECTRICAL RESISTIVITY -- COBALT + PALLADIUM + Σ_{i} (10-30 Pd and 5-30 Cu)

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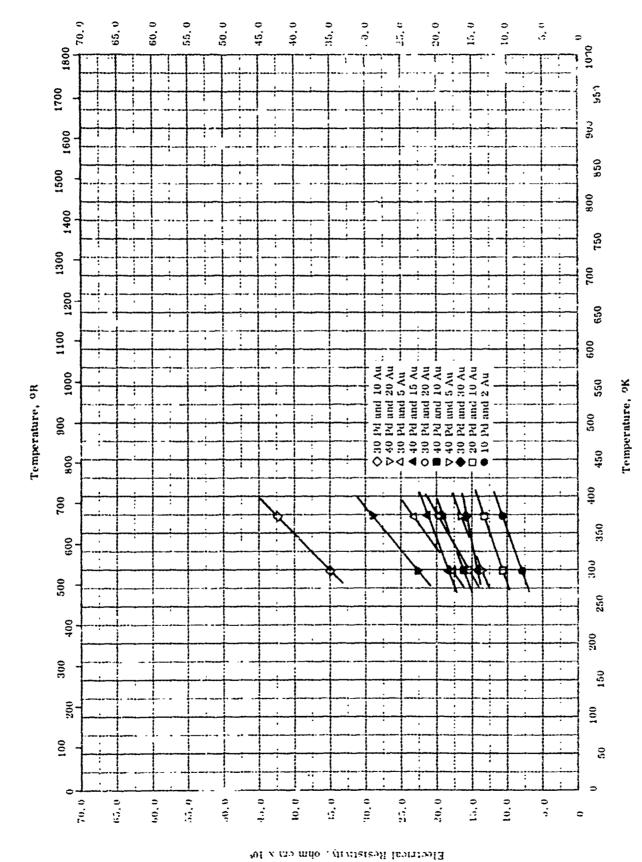
Electrical Resistivity, ohm cm x 106

ELECTRICAL RESISTIVITY -- COBALT + PALLADIUM + ΣX_1 (10-30 Pd and 5-30 Cu)

REFERENCE INFORMATION

O 56-24 29 C 56-24 29 C 56-24 29 C 56-24 29 ■ 56-24 29 ■ 56-24 29	298-373 298-373 298-373 298-373 298-373 298-373	85 Co, 10 Pd.and 5 Cu. 70 Co, 20 Pd, and 10 Cu. 60 Co, 30 Pd, and 20 Cu. 60 Co, 20 Pd, and 20 Cu. 50 Co, 40 Pd, and 20 Cu. 50 Co, 50 Pd, and 20 Cu. 40 Co, 40 Pd, and 20 Cu. 40 Co, 30 Pd, and 30 Cu.	Annealed 150 hrs at 1000 C in vacuum; cooled in 10 hrs. Same as above.
56-24 56-24 56-24 56-24 56-24	98-373 98-373 98-373 98-373 98-373	70 Co, 20 Pd, and 10 Cu, 60 Co, 30 Pd, and 10 Cu, 60 Co, 20 Pd, and 20 Cu, 50 Co, 40 Pd, and 10 Cu, 50 Co, 50 Pd, and 20 Cu, 40 Co, 40 Pd, and 20 Cu, 40 Co, 30 Pd, and 30 Cu,	Same as above. Same as above. Same as above. Same as above. Same as above. Same as above.
56-24 56-24 56-24 56-24 56-24 56-24	98-373 98-373 98-373 98-373 98-373	70 Co, 20 Pd, and 10 Cu, 60 Co, 30 Pd, and 20 Cu, 60 Co, 20 Pd, and 20 Cu, 50 Co, 40 Pd, and 20 Cu, 50 Co, 50 Pd, and 20 Cu, 40 Co, 40 Pd, and 20 Cu, 40 Co, 30 Pd, and 30 Cu,	Same as above. Same as above. Same as above. Same as above. Same as above.
56-24 56-24 56-24 56-24 56-24	98-373 98-373 98-373 98-373	60 Co, 30 Pd, and 10 Cu. 60 Co, 20 Pd, and 20 Cu. 50 Co, 40 Pd, and 10 Cu. 50 Co, 50 Pd, and 20 Cu. 40 Co, 40 Pd, and 20 Cu. 40 Co, 30 Pd, and 30 Cu.	Same as above. Same as above. Same as above. Same as above. Same as above.
56-24 56-24 56-24 56-24	98-373 98-373 98-373 98-373		Same as above. Same as above. Same as above. Same as above.
56-24 56-24 56-24 56-24	98-373 98-373 98-373		Same as above. Same as above. Same as above. Same as above.
56-24 56-24 56-24	98-373 98-373		Same as above. Same as above. Same as above.
56-24 5 6- 24	98-373		Same as above. Same as above.
56-24	38-373		Кате ав авоуе.
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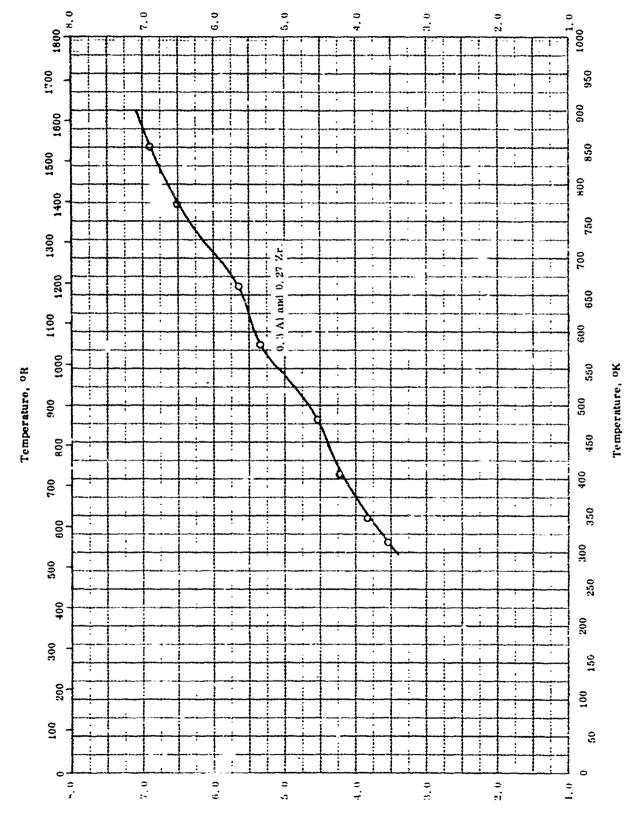


ELECTRICAL RESISTIVITY -- COBALT + PALLADIUM + $2X_1$ (10-40 Pd and 2-30 Au)

ELECTRICAL RESISTIVITY -- COBALT + PALLADIUM + ΣX_1 (10-20 Pd and 2-30 Au)

REFERENCE INFORMATION

	 -										
Remarks	Annealed 100-150 hrs close to solidus temperature in vacuum; cooled slowly to room temperature.	Same as above.	Same as above.	Same as altove,	Same as above.	Same as alove,	Same as above.	Same as above.	Same as above.	Same as above.	
Sample Specifications	нн Со. 10 Pd. und 2 Au.	69.6 Co, 20.1 Pd, and 10.3 Au.	64, 6 Co, 30, 2 Pd, and 5, 2 Au.	60 Co, 30 Pd, and 10 Au.	54.6 Co, 40, 1 Pd, and 5.3 Au,	50 Co, 30 Pd, and 20 Au.	49, 7 .o. 40, 1 Pd, and 10, 2 Au,	44, 5 Co, 40, 3 Pd, and 15, 2 Au.	40 Co, 40 Pd, and 20 Au.	40 Co, 30 Pd, and 30 Au,	
Reps.		_				-					
Temp. Range ok	298-373	298-373	298-373	298 373	298-373	298-373	298-373	298-373	298-373	298-373	
				r.	ç	ç;	က္	::	- 55 - 55	3	
Ref.	56-25	56.25	56-25	56-25	56.25	26-25	56-25	56-25	\$6-25	98-39	



ELECTRICAL RESISTIVITY -- COPPER + ALUMINUM + TX

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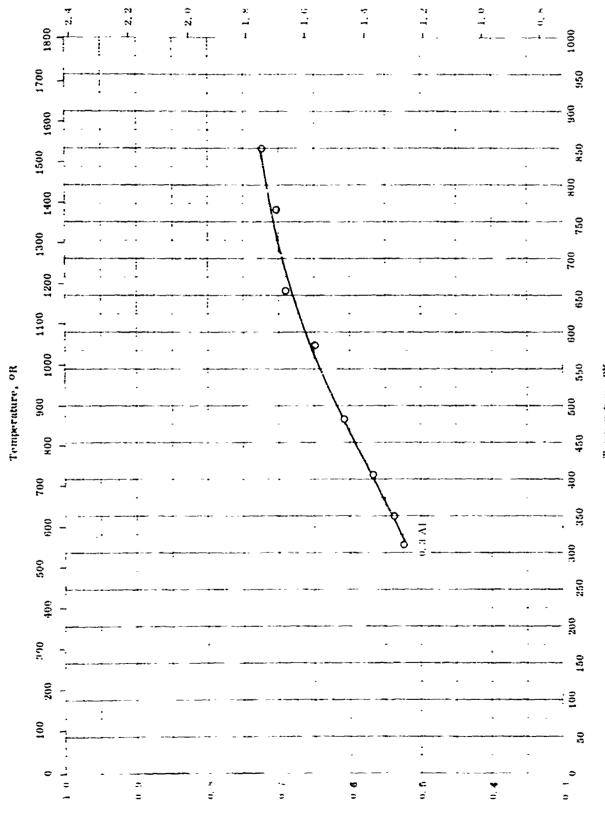
947

ELECTRICAL RESISTIVITY -- COPPER + ALUMINUM + EN

REFERENCE INFORMATION

Remarks	Normalfzed.
Sample Specifications	0.3 Al and 0.27 Zv.
Rept. Error%	
Temp. Range CK	314853
Ret.	9 " 9 %
Sym Sol	0

THERMAL CONDUCTIVITY - COPPER + ALBMINUM + EN



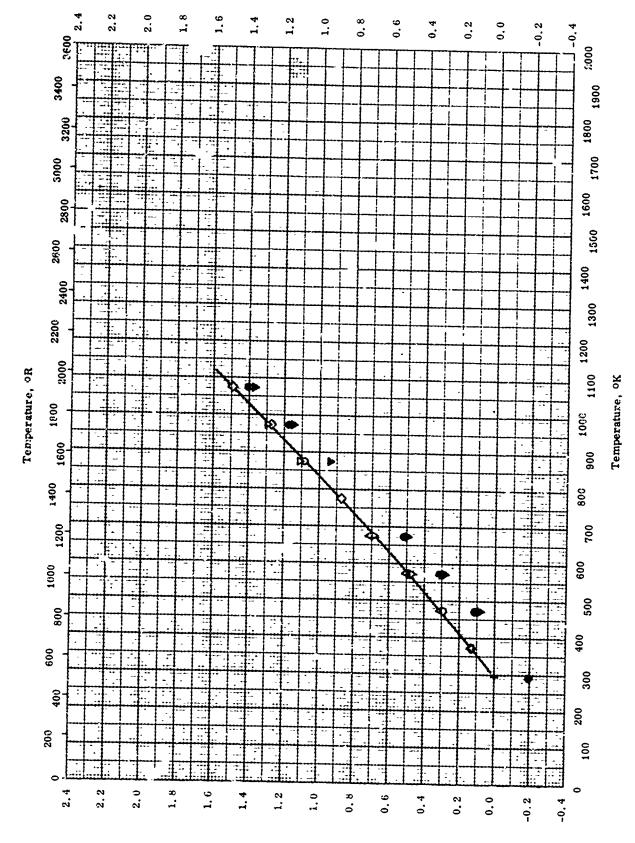
Therma, Conducting, (al Soc 1, cm⁻¹ K⁻¹

HIERMAL CONDUCTIVITY +- COPPER + ALBMIN'S + 2. N₁

RELEBENCE INCORMATION

RUMARKA	Normuitzed,		
Samulo Specifications	0, 1.Al, 0 .32 Ar		
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ET.	C		

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Thermal Linear Expansion, percent

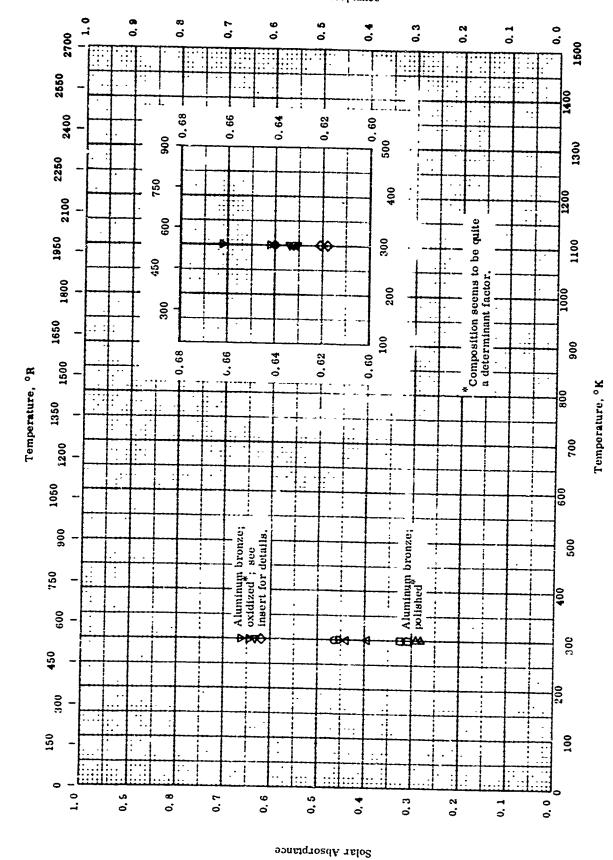
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THERMAL LINEAR EXPANSION -- COPPER + ALUMINUM + $\Sigma x_{_{f i}}$

Thermal linear expansion ... copper + aluminum + Σx_i

REFERENCE INFORMATION

Remarks	Extruded at approx 1550 F and aged at room temperature 18 to 40 months; plotted data show average (within 1%) for 2 samples; both heating and cooling.	Average for 4 samples, cast at 1200 C and annealed; cast, annealed, and quenched; air-cooled.	Heating.	The above specimen, cooling.	Heating.	The above specimen, cooling.	
Sample Specifications	Tc - Al Bronze; 88, 13 Cu, 9. 50 Al, 1. 95 Fe, and 0. 42 Te.	Tempaloy 841; 89.67 Cu, 5.04 Al, 4.47 Ni, and 0.82 Si.	Al Bronze; 89.71 Cu, 9.29 Al, 0.44 Fe, 0.38 Sn and 0.18 Ni.	Same as above.	Al Bronze; 89,43 Cu, 9.30 Al, 0.58 Fe, 0.36 Ni, and 0.33 Sn.	Same as above.	
Rept.							
Temp.		293-1073	293-1073	293-1073	293-1073	293-1073	
Ref.	47-6	43-6	43-8	43-8	43-8	43-8	
Sym	٥	♦	D	>	0	•	



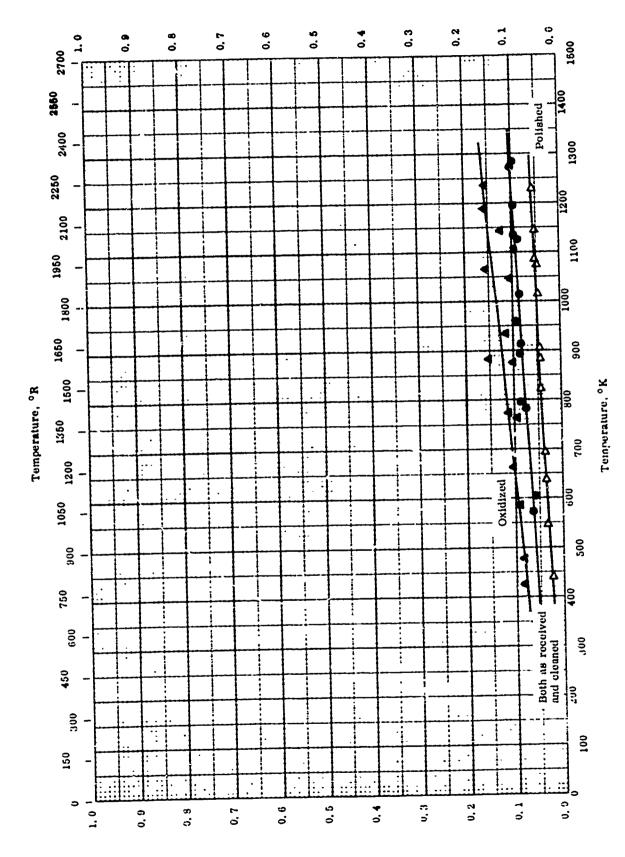
SOLAR ABSORPTANCE -- COPPER + ALUMINUM + Σ_{X_1}

TPRC

SOLAR ABSORPTANCE -- COPPER + ALUMINUM + ΣX_{j}

REFERENCE INFORMATION

Remarks	As received.	Cleaned with a liquid detergent.	Polished with fine polishing compounds on a buffing wheel,	Oxidized in air at red heat for 36 min.	As received.	Cleaned with a liquid detergent.	Polished with fine polishing compounds on a buffing wheel.	Oxidized in air at red heat for 30 min,	
Sample Specifications	Aiuminum bronze; 92-96 Cu, 4-7 Al, and 0,5 max. Fe.	Aluminum bronze; 92-96 Cu, 4-7 Al, and 0.5 max. Fe.	Aluminum bronzu; 92-96 Cu, 4-7 Al, and 0, 5 max. Fe.	Aluminum bronzo; 92-96 Cu, 4-7 Al, und 0,5 max. Fe.	Aluminum bronze; 88-92.5 Cu, 6-8 Al, 3.5 max. Fe, and 1 max. Mn.	Aluminum bronze; 88-92.5 Cu, 6-8 Al, 3.5 max. Fe, and 1 max. Mn.	Aluminum bronze; 88-92.5 Cu, 6-8 Al, 3.5 max. Fe, and 1 max. Mn.	Aluminum bronzo; 88 - 92, 5 Cu, 6 - 8 Al, 3, 5 max. Fe, and 1 max. Mn.	
Rept. Error%				·					
Temp. Runge ok	298	298	298	867	298	298	298	866 81	
Ref.	57-48	57-48	57-48	57-48	57-48	57-48	57-48	57-1-48	
Sym	0	٥	0	٥	♦	▽	Δ	•	_



Sormal Total Emittance

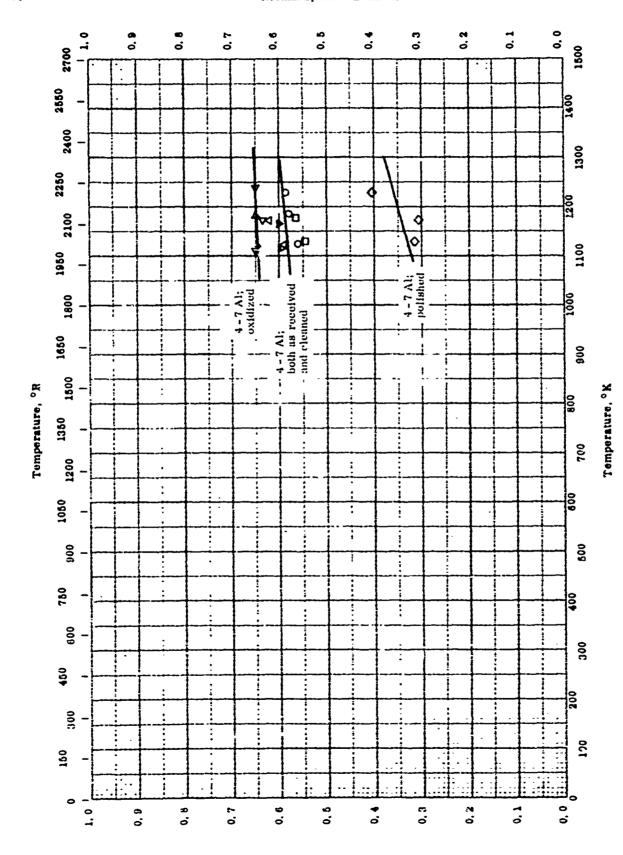
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NORMAL TOTAL EMITTANCE -- COPPER + ALUMINUM + $\Sigma x_{\mathbf{j}}$

REFERENCE INFORMATION

Remarks	Measured in vacuum (5 x 10 ⁻⁴ mm Hg); rume data for as received and cleaned (with a 110 \pm d detergent).	Polished with fine polishing compounds on a buffing wheel; measured in vacuum (5 x 10^{-4} mm Hg).	Oxidized in air at red heat for 30 min,; measured in vacuu: $(5 \times 10^{-4} \text{ mm Hg})$.	
Sample Specifications	92 - 96 Cu, 4 - 7 Al, 0.5 max, Fc.	92 - 96 Cu, 4 - 7 Al, 0.5 mux. Fc.	92 - vd Cu, 4 - 7 Al, 0,5 max. Fc.	
Rept. Error%	t 10	# 10	7 10	
Temp. Range ok	573-1283	440-1228	422-1233	
Ref.	67-48	67-48	57-48	
Sym	•	Δ	4	

3.



NORMAL SPECTRAL EMITTANCE ... COPPER + ALUMINUM + EX; (4-7 Aluminum Bronze)

Sormal Spectral Emitance

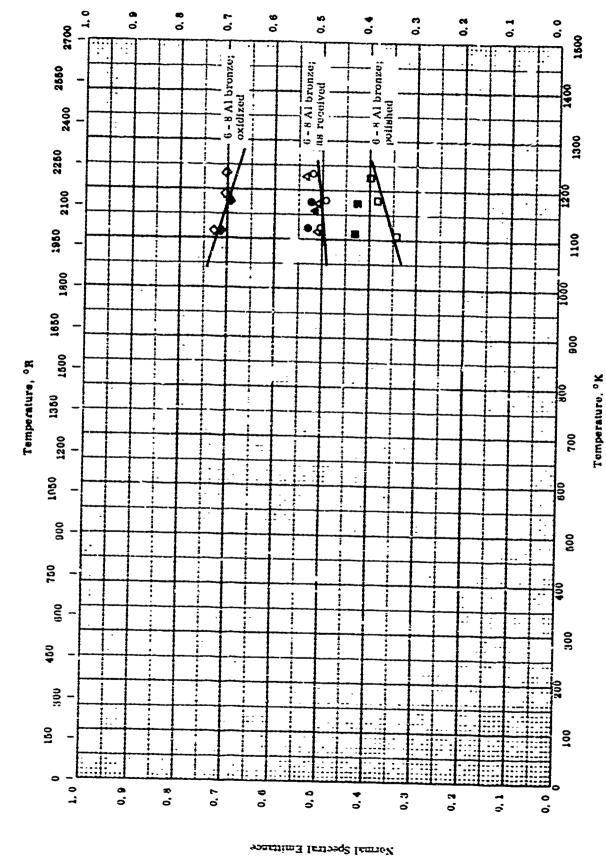
NORMAL SPECTRAL EMITTANCE -- COPPER (ALUMINUM (EX) (4-7 Aluminum Bronze)

REFERFNCE INFORMATION

By E	Rof.	Wavelength	Tomp. o K	Rept. Error%	Sample Specifications	Remarks
0	5718	0, 865	1126-1228	01 т	92 - 96 Cu, 4 - 7 Al, und 0, 5 max. Fe.	As received; mensared in vacuum of 5x 10-4 mm lig; first cycle heating.
Ø	81-19	0, 665	1122-1172	01 F	Same as above.	Sume as above; first cycle cooling.
0	67-48	0, 665	1130-1228	31 F	Same as above.	Cleaned with liquid detergent; mensured in vacuum of 5x 10 ⁻⁴ mm/lg; first cycle heating.
۵	67-48	0, 005	1110-1300	01 F	Вато ин авхого.	Same as above; first cycle cooling.
\lambda	57£8	0* 000	1128-1228	01 -	Samo an alxoyo.	Polished with fine poliching compounds on a buffing wheel; measured in vacuum of 5x 10 ⁻⁴ mmlig; first cycle heating.
₹	57 -48	0, 668	ca21-1111	. 1 .10	Same an above.	Oxidized in air at red heat for 30 min; monsured in vacuum of 5x 10 ⁻⁴ mm lig; first cycle heating.
Δ	67 <u>-4</u> 8	0, 685	1116-1182	01 +	Same no nboye.	Same as above; first cycle cooling.

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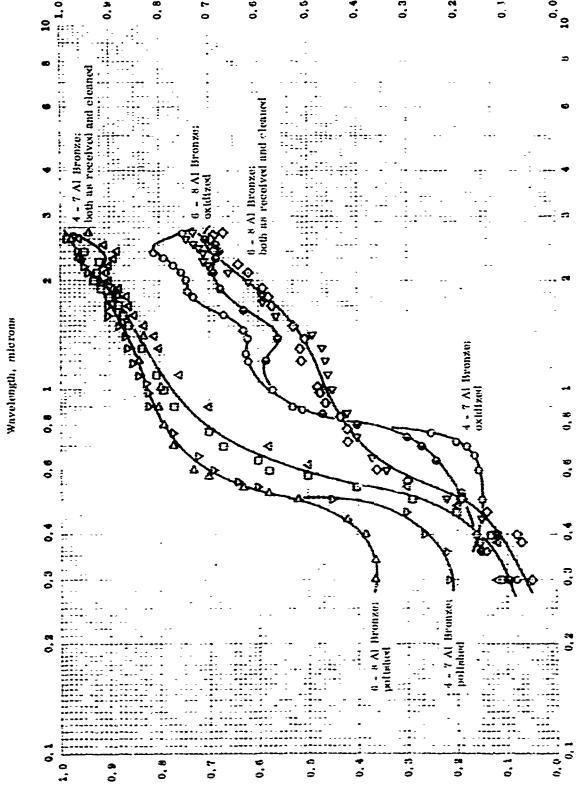
NORMAL SPECTRAL EMITTANCE -- COPPER + ALUMINUM + Σx_1 (6 - 8 Aluminum Bronze)

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NORMAL SPECTRAL EMITTANCE -- COPPER + ALUMINUM + EX₁ (6 - 8 Aluminum Bronze)

E N	Raf.	Wavelength	Temp. oK	Rept.	Sample Specifications	Romarks
0	07-48	999'0	1122-1233		Aluminum bronze; 88 - 92, 5 Cu, 15 - 8 Al, 3, 5 max, Fo, and 1 max, Mn.	As recoived; measured in vacuum of 5x 10 ⁻⁴ mm Hg; first eyelo heating.
•	B7-411	0. 636	1122-1178		Santo an abovo.	Same as above; first cycle cooling.
Ċ	95	0, 866	1116-1227		Sumo as above.	Clemed with a liquid detergent; measured in vacuum of 5 x 10 4mm Hg; first cycle heating.
◀	67-48	0, 666	X110-1167		Rume as above.	Sume as above; first cycle cooling.
Ð	67-48	0, nup	1108-1226		Ватич ам акоми.	Polished with fine polishing compound on a buffing wheel; measured in vacuum of 5x 10-4 mm Hg; first cycle heating.
•	07-48	0, 885	1112-1172		Same as above.	Same as above; first eyele cocling.
\lambda	n7-48	0, 685	1114-1233		Samo as above,	Oxialzed in air at red heat for 30 min; mensured in vacuum of 5x 10 ⁻⁴ mm Hg; first cycle heating,
•	274H	0. 665	1118-1178		Same as above.	Same as above; first cycle cooling.

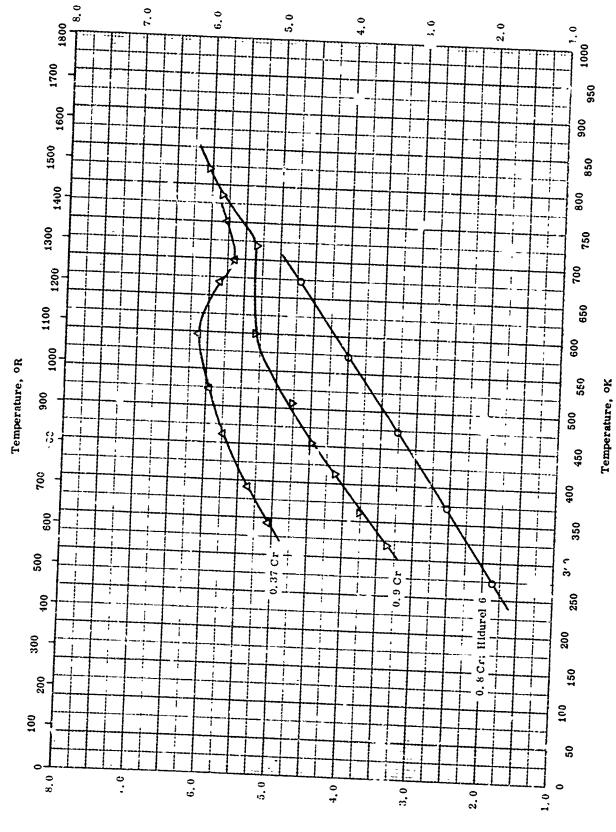


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NOUMAL BPECTRAL REFLECTANCE ... COUPER + ALIMINUM + EX

					<u> </u>			
Komarka	Oxidized in air at red heat for 30 min., data taken from amosth curve.	As received, data taken from amooth curve.	Chenned with a liquid detergent; data taken from smooth curve.	Pollahed with fine pollabing compounds on a buffing wheelt that taken from smooth curve.	As received; data taken from smooth curve,	Cleaned with a liquid detergent; data taken from smooth curve,	Polished with fine polishing compounds on a buffing wheel; data taken from smooth eurvo.	Oxidized in air at red heat for 30 min.; data taken from Amouth curve,
Hample B. suffications	Aluminum bronzej 92 - pil Cu, 4 - 7 Al, and 0, 6 mux. Fe.	Auminum bronzes 92 - 96 Cu, 4 - 7 Al, und 9, 6 mux. Fo.	Aluminum branzer 92 . 96 Ch. 4 . 7 Al. and 9. 6 max. Per.	Aluminum bronzer 92 - 96 Cu, 4 - 5 Al, and 9, 6 max. Pe.	Aluminum bronzes 88 02. 6 8 Al, 3. 0 max, Fe, and t max. Ma.	Aluminum brunzet 88 - 65. 6 Cu, 6 - 8 Al, 5. 6 max, Pe., 5. 6 max, Fe, 3. 6 max, Fe, and I max, Mn.	Atumman bronzes 48 - 92, 6 - 8 Al, 3, 6 max. Fe, and I max. Mo.	Aluminum bronzen 88 - 92, 5 Cu, 6 - 6 Al, 3, 6 max, Fe, 3, 6 max, Fe, 3, 6 max, Fe, and I max, Mu,
P. P. P. P.	-	-	-	÷	:	-	-	₹ -4
Wavelength Hange, H	0, 3-3, 7	0,3.3.0	9 '8 - 8 '0	0 15-6 10	0, 83, 7	0, 3 - 3, 7	0, 3.3,7	6 6
Trimp, "K	¥48	но7	E GE	200	200	* 0.72	£	# GE
Inf.	11-48	6714	h7 -4 B	674u	67.4R	67×4H	67 -4H	5.7 4.4
100	٥	<		>	\$	₹	۵	•



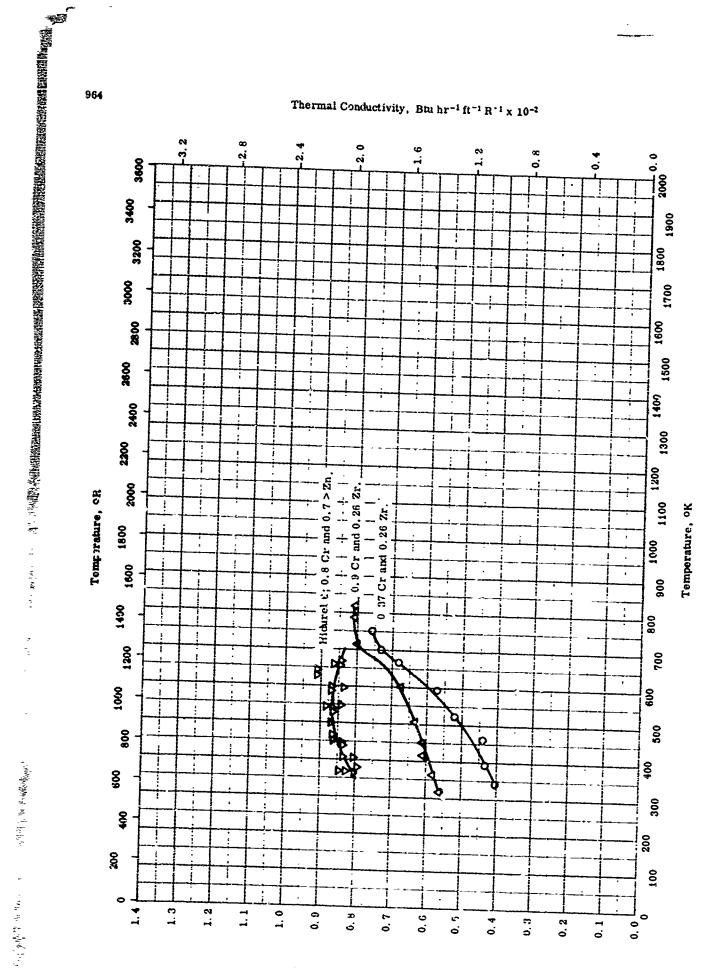


Electrical Resistivity, ohm cm x 106

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ELECTRICAL RESISTIVITY -- COPPER + CHROMIUM + Σx_i

			500 C
Remarks	Normalized.	Same as above.	Hot-rolled; solution-treated to insure max solution of Cr. followed by water quenching; aged at 500 C followed by air cooling.
		_	ં
			Hidwrel C: 0.8 Cr, 0.7 > Zn, 0.05 > Fb, 0.03 Ni, 0.02 Fe, 0.01 > Si, and Al. Mn, and Sn not detected.
ns			6.03 Ni ited.
Sample Specifications			iddurel 6: 0.8 Cr. 0.7 > Zn, 0.05 > J·b, 0.0 0.01 > Si, and Al. Mn, and Sn not detected.
mple Sp.	18 Zr.	Zr.	and Sn :
S	0.25 - 0.28 Zr.	0.9 Cr and 0.25 - 0.28 Zr.	AI, Mn,
	r, and 0.	and 0.25	V SI, and SI,
	0.37 Cr. and	0.9 Cr	Hidure 0, 01 :
Rept. Error%			
	343-751	316-821	273-673
'i emp. Range ok	343	316	273
Re!.	9-9′,	26-6	8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Sym	٥	D	0



Thermal conductivity -- copper + chromium + Σx_1

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

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THERMAL CONDUCTIVITY -- COPPER + CHROMIUM + Σx_1

Remarks	Normalized.	Normalized.	Not rolled bar; solution treated at a temperature sufficient to ensure max, solution of Cr, waterquenched, and then aging at 500 C followed by air cooling.
Sample Specifications	0,37 Cr, 0,25-0,28 Zr.	0,9 Cr, 0,25-0,28 Zr,	Hidurel 6: average chemicul analysis 0. 8 Cr.; spectrographic analysis: 0.7 > Zn, 0.05 > Pb, 0.03 Ni, 0.02 Fe, and 0.01 > Si,
Rept. Error %			e-
Temp. Runge oK	343-751	316-821	364-667
Ref.	9-93	9-99	84-2
Sym	0	٥	D

ALE ALE CHARACTER CHARACTE

REPORTED VALUES

Melt	ing Peint:	К	R
0	20 Co and 10 Pd	1340	2413
	30 Co and 10 Pd	1356	2441
Δ	30 Co and 20 Pd	1396	2513
∇	49 Co and 20 Pd	1415	2548
\Diamond	30 Co and 30 Pd	1403	2526

PROPERTIES OF COPPER + COBALT + Σx_1

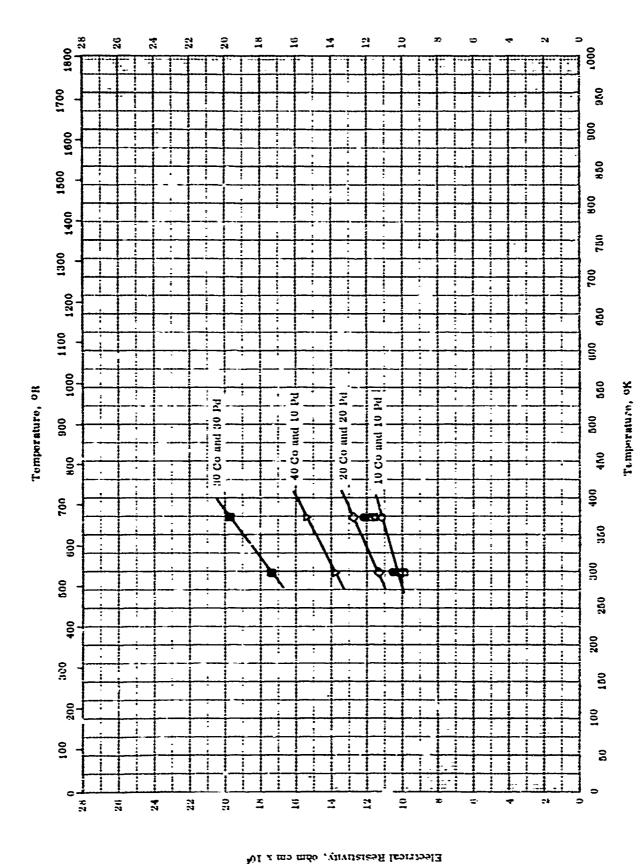
REFERENCE INFORMATION

Remarks	M.V. from break in time-temperature curve.	Same as above.	Same as above.	Same as above.	Same na above.	
Sample Specifications	70 Cu, 20 Co, and 10 Pd; from electrolytic Cu and Co with 0.01 > C.	30 Co and 10 Pd; sume as alxova.	od Go and 20 Pd; same as above.	40 Co and 20 Pd; same as above.	30 Co and 30 Pd; нате ин акусе.	
Rept.	······					
remp. Rapge ok	1340	9961	1396	1416	1403	
Ret.	56-24	36-24	56-24	96-24	2-99	
E S	0	0	٥	D	\ \	

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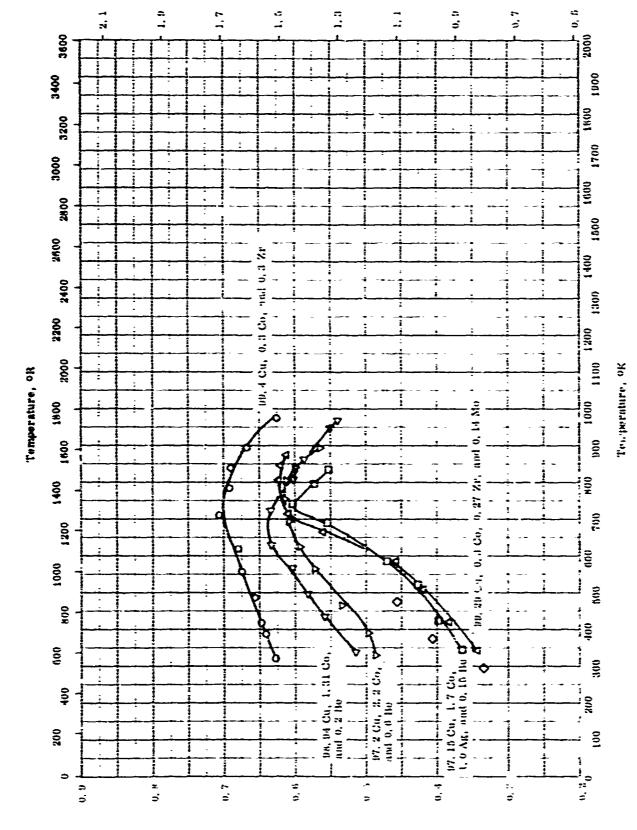


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ELECTRICAL RESISTIVITY -- COPPER + CONALT + EX

7		·						
Romarks	Annouled 150 hrs at 1000 C in vacuum and cooled in 10 hrs.	Samo as abovo.	Same as above.	Same an above,	Same us above.	Sumo an above,	Sumo an abovo.	
ations								
Sample Specifications								
duns	und 10 Pd.	10 Pd.	10 Pd.	20 Pd.	10 Pd.	20 Pd.	30 Pd.	
	10 Cu und	70 Cu, 20 Co and 10 Pd.	60 Cu, 30 Co and 10 Pd,	de Cu, 20 Co and 20 Pd.	50 Cu, 40 Co and 10 Fd.	40 Cu, 40 Co and 20 Ad,	40 Cu, 30 Co and 30 Pd.	
	80 Cu, 10 Cu	70 Cu,	00 Cu,	40 Cu,	20 Cu,	40 Cu,	40 Cu,	
Error %					- - -			
Tomp.		208-373	20H-073	208-373	298-373	:: NOH-:: 17:3	308-373	
=						-	<u>.</u>	
10.6.	601-24	00-24	50-24	66-34	56-24	56-24	50-24	

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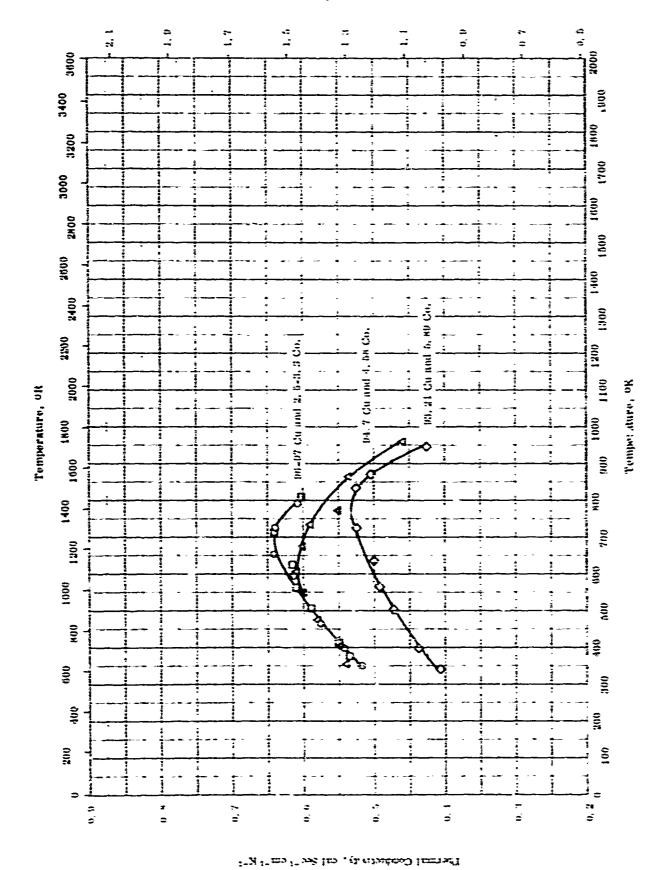


THERMAL CONDUCTIVITY -- COPPER + COBALT + EXI

Thermal Conducting, and Sec 2 cm $^{\circ}$ Kal

THERMAL CONDUCTIVITY ... COPPER + CODALT + ΣX_1 (0.3 - 2.3 Co)

							
Ичнигка						Normalized at 1000 C for 30 min,	
Sample Becuffications	99,4 Cu, 0,3 Co, and 0,3 Zr,	97, 15 Сц. 1, 7 Со. 1, 9 Ак. 6, 16 Ис.	99, 29 Ce, 0, 30 Co, 0 27 Zr, and 0, 14 Mo,	07, 2 Cu, 2, 2 Co, and 0, 4 Bo.	DR, 19 Cu, 1, 31 Co, and 0, 2 No.	97, 1 Cu, 2, 2 Co, and 0, 8 Bo,	
Frank Strong							
Range ok Error ".	321-076	1-12-KIG	341-673	330-803	3138-96K	11.4. mag	
Mert,	57 - 12	2-70	07-3	672	20-1	e-e-	
	0	٥	٥	Þ	♡	\lambda	



THERMAL COSBUCTIVITY ... COPPER (COBALT) (EX)

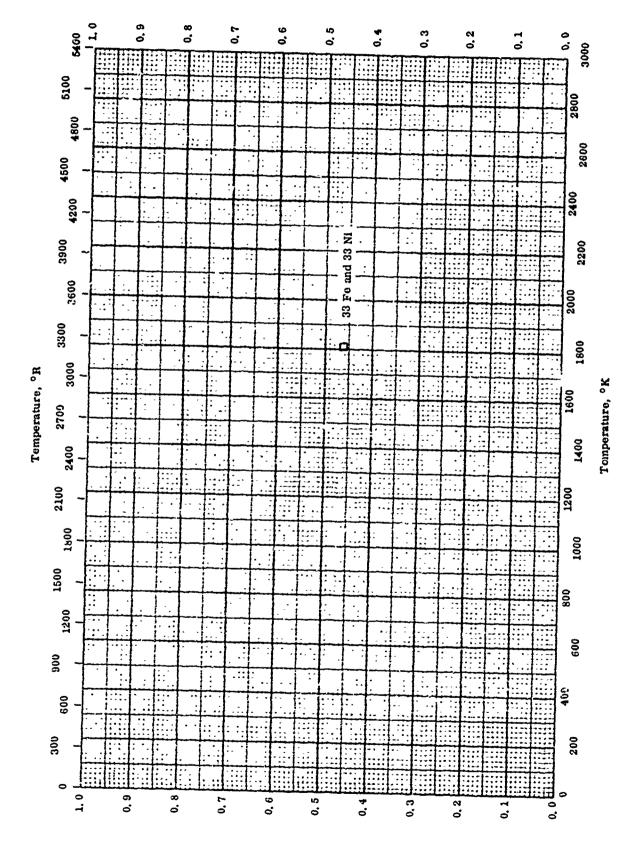
PHERINAL CONDUCTIVITY ** COPPER + COBALT + EX; (3, 5 + 6, 9 Co)

REPRIENCE INFORMATION

E-52	fyin the	Tomas OK	Kreat &	Tonny, Kriter 3.	AND THE PROPERTY OF THE PROPER
o	1-44	102-001		64 Co, and 6, 4 Do,	
۵	1-00	376.410		190, 23 CM, 3, 27 CM, and 0, 8 He.	
<	1.46	กอล-ขอเ		94, 73 (4), 4, 50 (4), and 9, 7 (40),	
0	60°-1	250-051		ph, 21 Cu, 6, 40 Co, and 6, 9 Do,	
		····			
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Normal Spectral Emittance

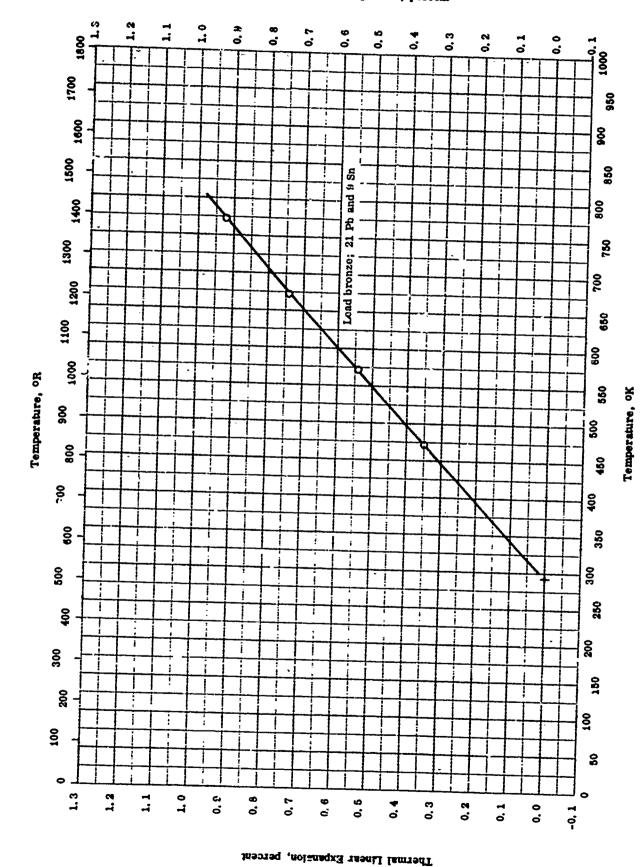
TPRC

Normal spectral emittance -- copper + iron + Σx_1

Normal spec fral emittance -- copper +1ron + ΣX_1

PERENCE INFORMATION

Remarks	Measured in 50 - 50 mixture of argon and hydrogen.
Sample Specifications	33. 33 Cu, 33.33 Fe, and 33. 33 Ni.
Rept. Error %	
Temp.º Range º K	1808
Wavelength µ	9. 65
Ref.	52-16
Sym	G



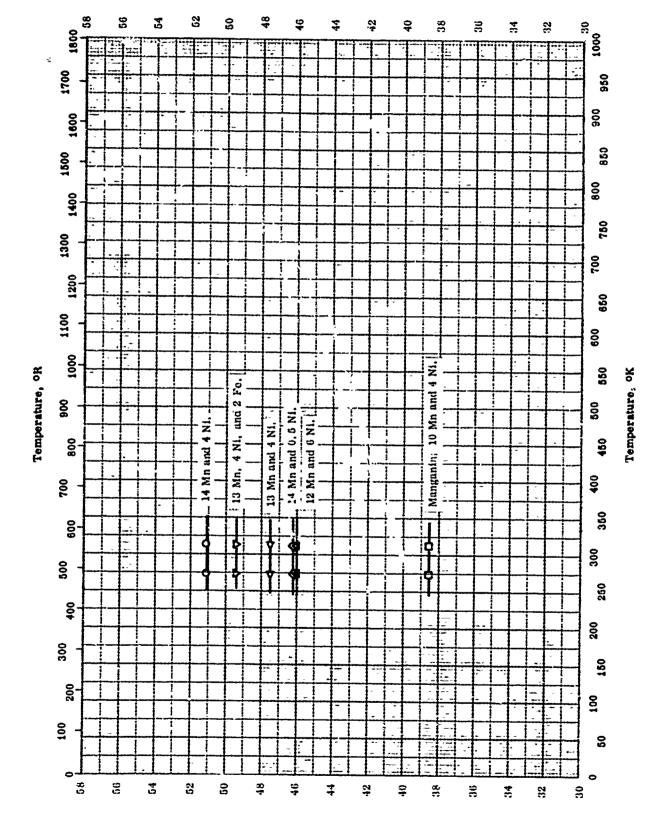
Thermal linear expansion -- copper + lead + Σx_i

Thermal linear expansion -- copper + Lead + Σx_1

Remarks	
Sample Specificatio.18	Lond bronzo; 70 Cu, 21 Pb, and 9 Sn.
Rept.	
Tump. Rango ok	293-773
Ref.	8 10 8
Sym	0

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ELECTRICAL RESISTIVITY -- COPPER | MANGANESE + TX,

Electrical Resistivity, ohm cm x 10t

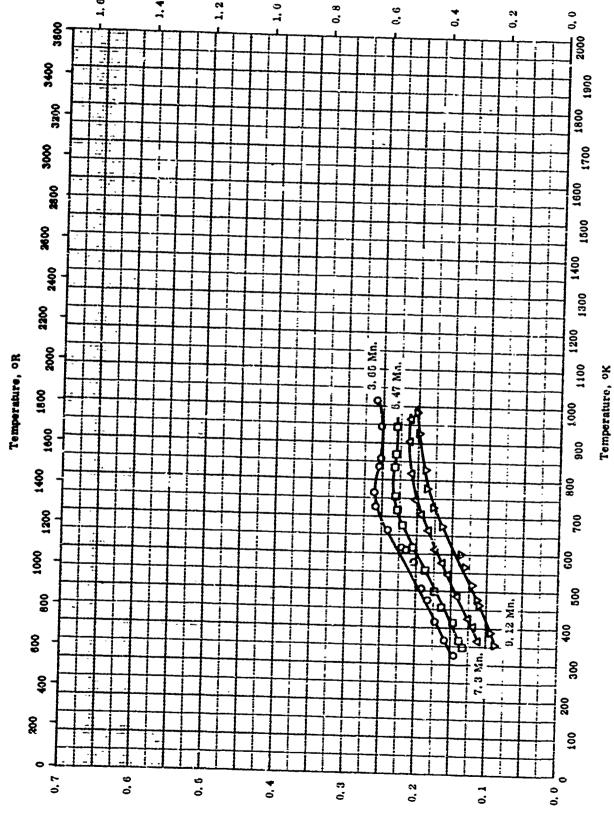
electical resistivity -- copper + manganese + $\Sigma X_{\underline{i}}$

REFERENCE INFORMATION

Romarks	Caet, pickled, cold rolled, unnealed 1 hr at 790 C in Nil, atm., slowly cooled to room temperature, cold drawn, unnealed 1 hr at 570 C in Nil, atm., reannealed and etched.	Same as above.	Same as above.	Same as above.	Somo as above,	Same as above,			
Sample Specifications	Manganin type alloy: 9.86 Mn, 4,35 Ni, 0.083 Fe, 0.008 > Mg, 0.04 > Si, and 0.001 > cach of others.	11.63 Mn. 6.03 Nl. 0.019 Fo. 0.008 > Mg. 0.004 > Sl. and 0.001 > each of others.	12.75 Mn, 4.25 Mi, 0.002 Fc, 0.008 > Mb, 0.004 > Si, and 0.001 > each of others.	12. 87 Mn, 4.27 Ni, 2.03 Fo, 0.008 > Mg, 0.004 > Si, and 0.001 > each of others.	13.64 Mn, 0.504 Ni, 0.231 Fo, 0.008 > Mg, 0.004 > Si, and 0.001 > each of others.	14.13 Mn, 4.26 Ni, 0.281 Fo, 0.008 > Mg, 0.004 > Bi, and 0.001 > each of others.			
Rept. Error%								 ,	
Temp. Range ok	273-313	273-313	273-313	270-213	273-313	273-313	···		
Ref.	26-32	56-32	66-32	56-35	26-32	66-32			
E S	0	٥	∇	D	\rightarrow	0			

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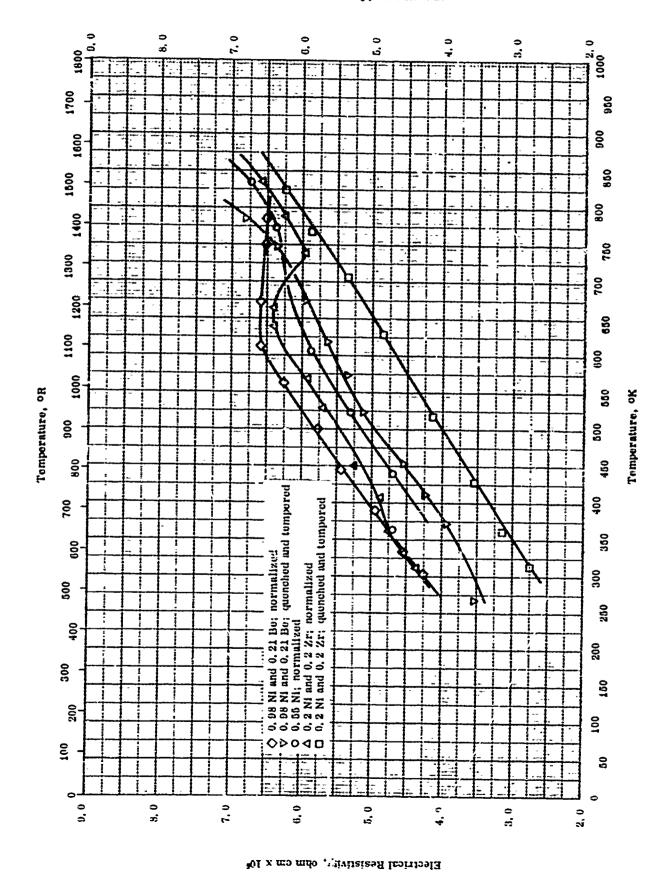
THERMAL CONDUCTIVITY -- COPPER + MANGANESE + Σx_j

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

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Thermal conductivity -- copper + manganese + Σx_i

П					
Remarks	Annoaled after hardening in vacuum at 300 C for 6 hrs.	Same as above.	Same as above.	Samo as abovo.	
3.8					
Sample Specifications	30,	Ъс,		30.	
Sample	96, 46 Cu, 3, 66 Mn, and 0, 9 Bo.	92 33 Cu, 6, 47 Mn, and 0, 9 Bu.	91. 8 Cu, 7.3 Mn, and 0.9 Bo.	89, 91 Cu, 9, 12 Mn, and 0, 0 Ro.	
	Cu, 0.66 M	Cu, 6.47 M	u, 7.3 Mn,	Cu, 9, 12 M	
			91, 8 C	89, 91	
Rept. Error%					
Tump. Range ok	_	348-946	362-963	363-981	
Ref.	58-B	58-5	58-5	58-5	
Sym Sol	O	ប	٥	D	

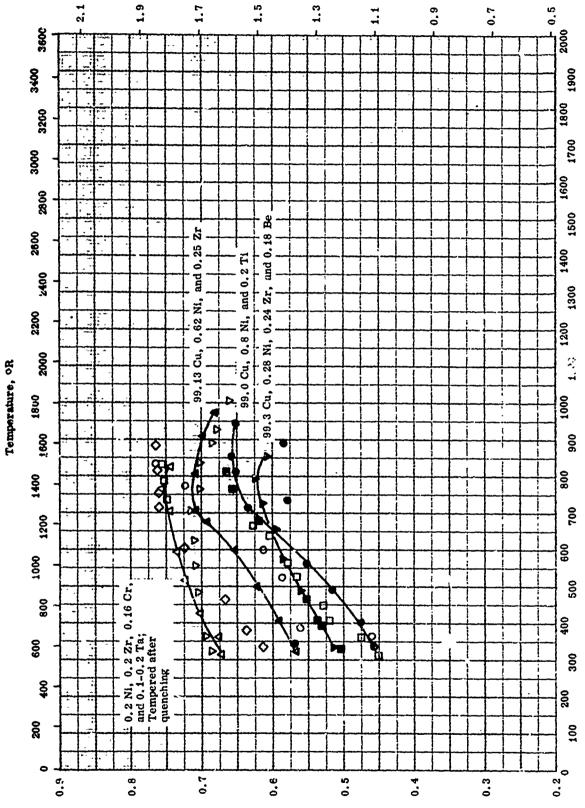


ELECTRICAL RESISTIVITY -- COPPER + NICKEL + 2X

announcemental profession and the contraction of t

Electrical resignivity -- copper + nickel + ΣX_j

Лешатки	Normalized,	Same as alxive.	Quenched and temporad,	Normalized,	Quenched and to apered.						
Sample Specifications	0, 55 Ni, 0, 25 Zr, and 0, 107 Ro,	0, 98 Ni and 0, 21 Ho.	Вато на проус.	0.2 NI, 0.2 Zr, 0.16 Cr, and 0.1-0.2 Tl,	Same an alxive,				•		
Ropt.											
Temp.	364-836	302-784	302-784	311-830	311- 535						
Ref.	20-02	9-99	9-99	9-99	9-99						
E S	0	\$	D	٥	۵		 	 		 	



Thermal Conductivity, cal Sec-1 cm-1 K^{-1}

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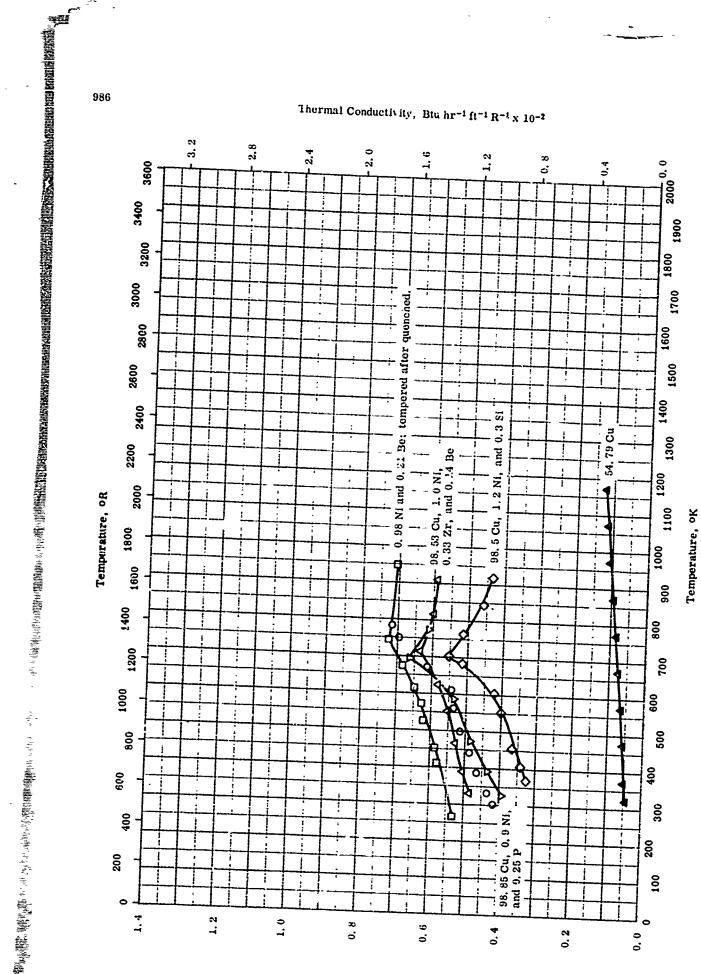
THERMAL CONDUCTIVITY -- COPPER + NICKEL + ΣX_i (0.2 < Ni < 0.9)

Temperature, oK

out touch this was martin hour to

"THERMAL CONDUCTIVITY -- COPPER + NICKEL + ΣX_1 (0, 2 s Ni < 0, 9)

Soil Soil	Ref.	Temp. Range oK	Rept. Error%	Sample Specifications	Remarks
0	566	364-836		0. 55 Ni, 0. 25 Zr, and 0. 107 Be.	Normalized.
D	26-6	311-835		0.2 Ni, 0.2 Zr, 0.16 Cr, and 0.1-0.2 Ta.	Normalized.
٥	26-6	311-835		Same as above.	Tempered after quenching.
D	57-2	321-1002		0,6 Ni, 0,27 Zr, and 0,1 P.	
ø	57-2	334-584		98, 99 Cu, 0, 6 Ni, 0, 26 Zr, and 0, 15 Sn.	
•	57-3	336-948		99.0 Cu, 0.8 Mi, and 0.2 Ti.	-
	57-3	331-815		98.73 Cu, 0.8 Ni, 0.33 Zr, and 0.14 Be.	
4	57-3	326-974		99. 13 Cu, 0. 62 Ni, and 0. 25 Zr.	
>	57-3	333-855		99.3 Cu, 0.28 Ni, 0.24 Zr, and 0.18 Bc.	
	السيرسيد				
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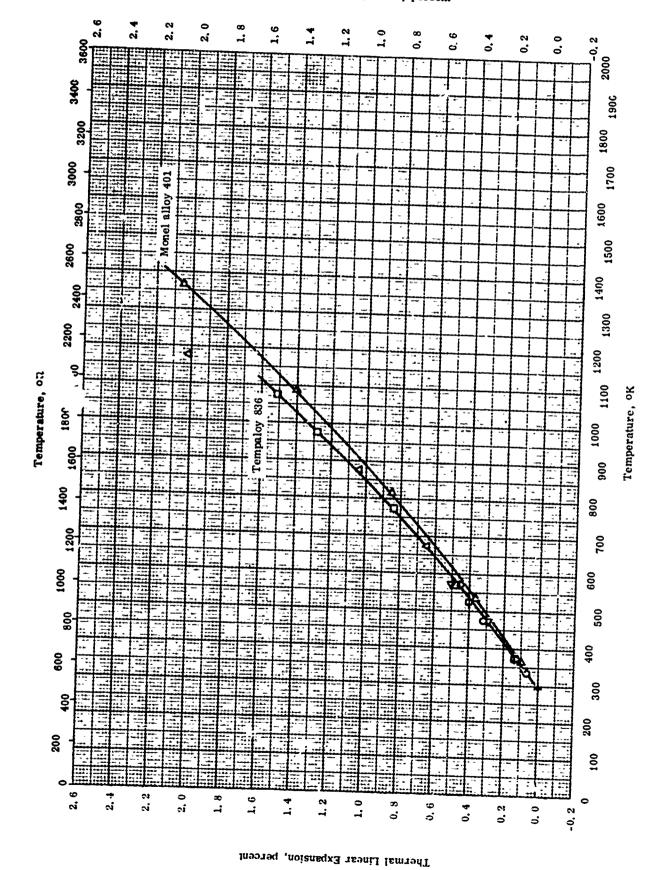
THERMAL CONDUCTIVITY -- COPPER † NICKEL + $\Sigma X_{\rm I}$ (N_i > 0, 9)

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

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THERMAL CONDUCTIVITY -- COPPER + NICKEL + ΣX_i (Ni ::0,9)

_							
Remarks	Normalized.	Tempered after quenched.					
Sample Specifications	0. 98 NI and 0. 21 Be.	0. 98 NJ and 0. 21 Be.	"Advanced"; 54.79 Cu, 44.04 Ni, 1.20 Mn, 0.035 C, and 0.003 Si.	98. 85 Cu, 0. 9 Ni, and 0. 25 P.	98. 5 Cu, 1.2 Ni, and 0.3 Sl.	98. 53 Cu, 1. 0 Ni, 0. 33 Zr, and 0. 14 Be.	
Rept. Error %							
Temp. Range ok	302~784	269-950	323-1173	329-773	370-920	333-910	
Ref.	9-99	9-99	53-2	57-3	57-3	67-3	
Sym	С	۵	4	٥	\Q	٥	



Thermal linear expansion -- copper + nickel + Σx_{j}

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Thermal linear expansion -- copper + nickel + Σx_1

Romarks	Average for 4 samples: (a) cast at 1200 C; (b) cast at 1200 C and annealed; (c) annealed and quenched; (d) cold worked.	Quenched from 1450 F, aged 1 hr at 800 F; and 18 months at room temperature.	Extruded rod; finished hard.	Cast bar,	Annealed at 1300 F.	
Sample Specifications	Tempaloy 836; 96 Cu, 3 Mi, 0, 61 Si, a d 0, 12 Fc.	Phosnic bronze; 98,47 Cu, 1,19 Ni, and 0,26 P.	Admiralty Nickel; 69, 57 Cu, 28, 70 Ni, and 0.91 Sn.	68 Cu, 20 Ni, and 12 Sn.	69, 42 Cu, 29 53 N1, 0, 53 Mn, 0.07 Fe, and 0, 05 Zn.	Monei alloy 401; International Nickel Co.; norminal: 53.0 Cu, 44.5 Ni, 1,70 Mn, 0.50 Co. 0.20 Fe, 0.01 Si, 0.03 C, and 0.005 S; density 0,321 lb in. ⁻³ .
Rept. Error%						
Temp.	293-1073	293-573	293-573	473-1173	293.573	293~1366
Gef.	43-6	47-6	43-6	43.6	47-6	₩
Sym bol	<u>.</u>	0	D	٩	∇	Δ

PROPERTIES OF COPPER + PALLADIUM + ΣX_i

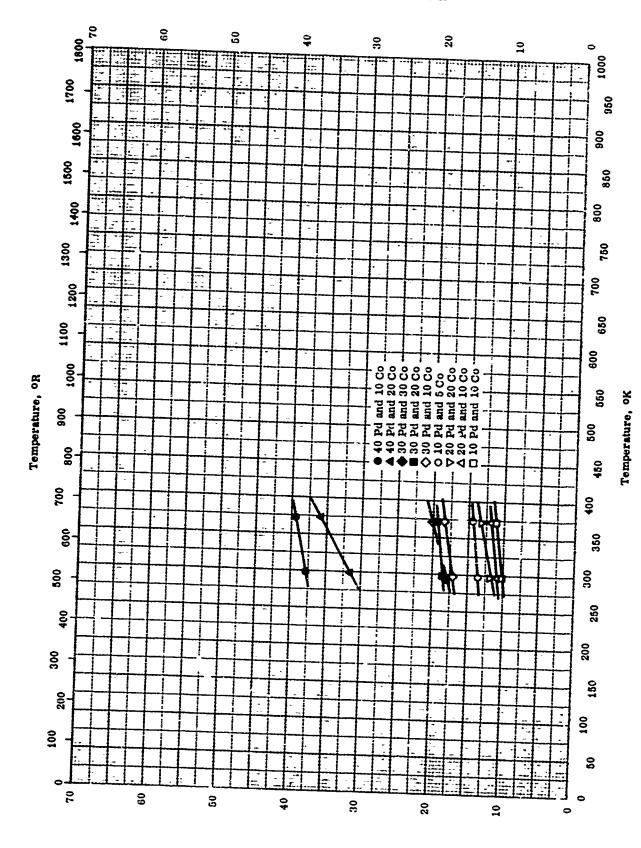
REPORTED VALUES

Melt	ing Point	К	R
0	30 Pd and 10 Co	1356	2441
0	40 Pd and 10 Co	1434	2582
Δ	30 Pd and 20 Co	1380	2485
₩	30 Pd and 30 Co	1403	2526

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Properties of copper + palladium + Σx_i

	ve during				
Remarka	M.P. from brenk in time-temperature cur- cooling.	Same as above.	Same as above.	Same as above,	
Sample Specifications	60 Cu, 30 Pd, and 10 Co; from electrolytic Cu and Co with 0.01 M.P. from brenk in time-temperature curve during > C.	50 Cu, 40 Pd, and 10 Co; same as above.	50 Cu, 30 Pd, and 20 Co; same as above.	40 Cu, 30 Pd, and 30 Co; same as above.	
Rept. Error%					
Temp. Range ok	1356	1434	1380	1403	
Ref.	56-24	56-24	56-24	56-24	
So _{II}	0	מ	٥	D	



ELECTRICAL RESISTIVITY -- COPPER + PALLADIUM + Σx_1

Electrical Resistivity, ohm cm x 106

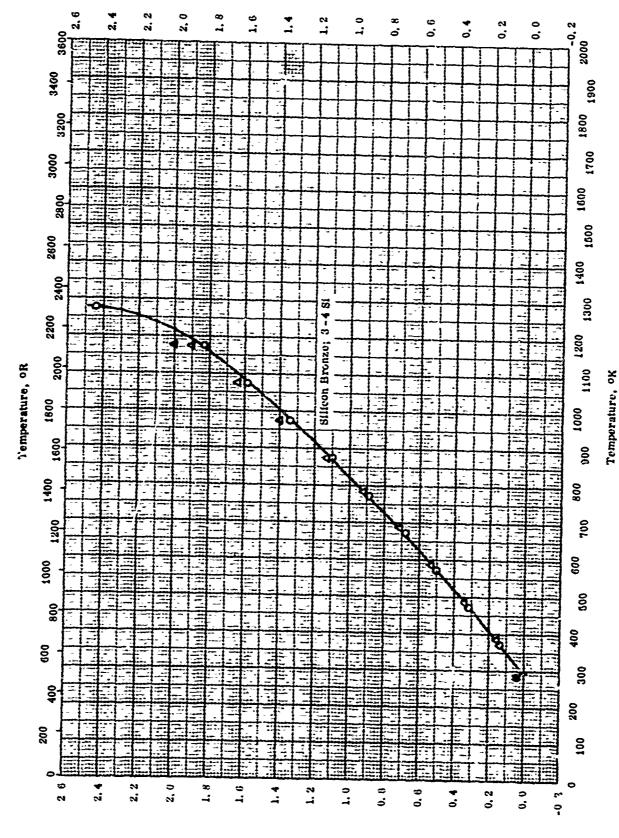
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ELECTRICAL RESISTIVITY -- COPPER + PALLADIUM + EX;

Rof.	Temp.	Rept.	Sample Specifications	Remarks
56-24	298-373		85 Cu, 10 Pd and 5 Co.	Annealed 150 hrs at 1000 C in vacuum and cooled in 10 hrs.
56-24	 296-373		80 Cu, 10 Pd and 10 Co.	Same as above.
68-24	298-373		70 Cu, 20 Pd and 10 Co.	Same as above.
56-24	 298-373		60 Cu, 30 Pd and 10 Cn.	Same as above.
56-24	 298-373		60 Cu, 20 Pd and 20 Co.	Same as above.
56-24	298-373		50 Cu, 40 Pd and 10 Co.	Same as above.
56-24	298-373		50 Cu, 30 Pd and 20 Co.	Same as above.
56-24	298-373		40 Cu, 40 Pd and 20 Co.	Sume as above.
56-24	298-373		40 Cu, 30 Pd and 30 Co.	Same as above.

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Thermal linear expansion -- copper +8112con + $\Sigma x_1^{}$

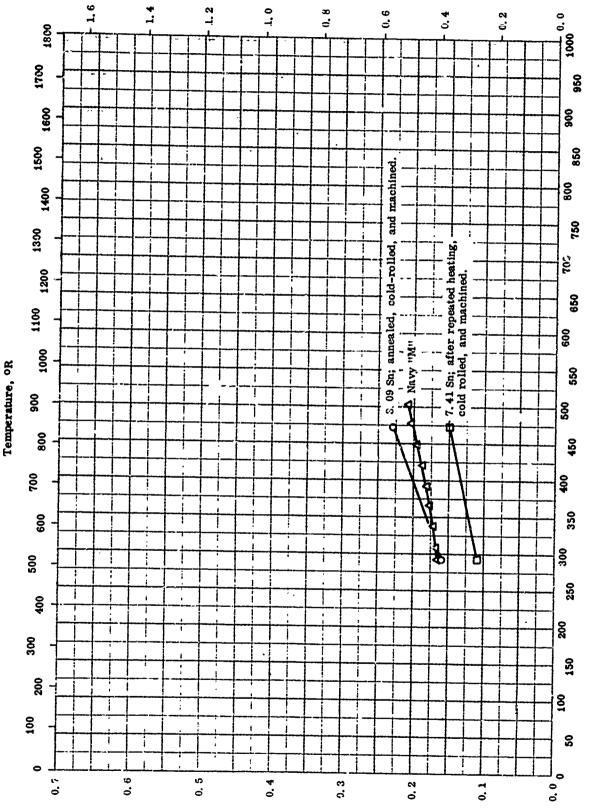
Thermal Linear Expansion, percent

995

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Thermal linear expansion -- copper + silicon + $\Sigma x_{\mathbf{i}}$

Romarks	2 samples: Hard drawn, and annealed; max doviation 2%.	The above specimen, cooling.	Below 2000 R, heating and cooling curves are graph- leally identical.		
Sumple Specifications	Billeon Bronzet 95,64 Cu, 3,04 St, 1,03 Mn, and 0.09 Fe.	Same an above.	Silicon Bronze: 24,33 Cu, 4,40 Si, 0,66 Mn, and 0,11 Fc.	Same as above.	
Rept. Error%		~~~~			
Temp. Range ok	6721-695	20%-1273	203-1173	29.1-1173	•
Ref.	43-8	43-3	43-6	43-8	
E CAS	0	•	₫	•	



Thermal Conductivity, cal Sec-1 cm-1 K-1

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THERMAL CC'IDUCTIVITY -- COPIER + TIN + $\Sigma X_{\rm I}$

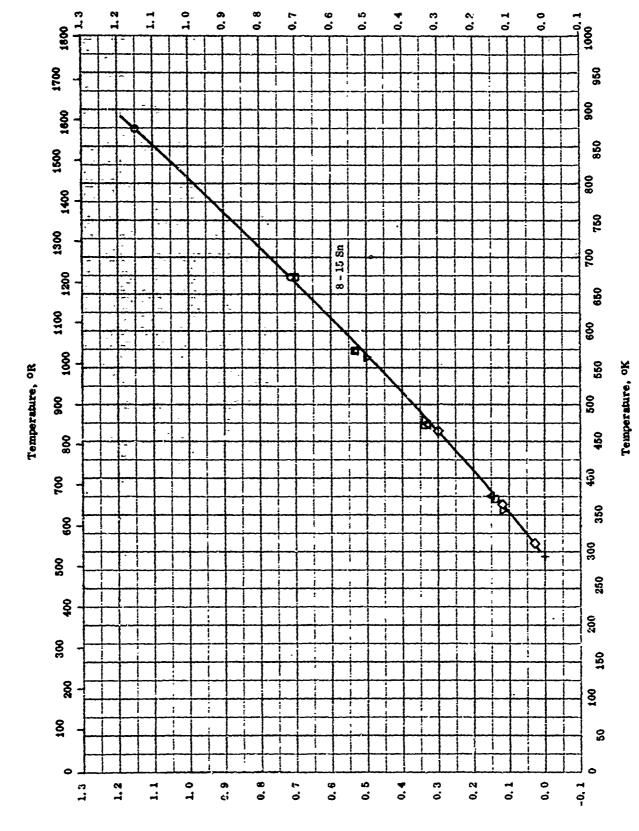
Temperature, oK

1

Thermal conductivity -- copper +tin + Σx_1

Remarks	Cast and air cooled; annealed at 625 C, cold-rolled, and machined.	Cast and air cooled; annealed at 625 C, hot-rolled at 300 C, annealed for 2 1/2 hrs at 625 C, again hot-rolled at 300 C, again amended for 2 1/2 hrs at 625 C, and then cold-rolled and machined.	
Sample Specifications	96.5 Cu, 3.09 Sn, 0.39 P, 0.01 Fe, 0.01 Ni, 0.005 > Sb, and 0.005 > Pb.	92.2 Cu, 7.41 Sn, 0.38 P, 0.02 Fc, 0.01 Pb, and 0.005 > Sb.	Navy "M"; 88.0 Cu, 5.7 Sn, 4.4 Zn, 1.4 Ph, 0.6 Ni, 6,13 Sb, 0.07 Fe, and 0.01 P.
Rept. Er. or %			T. T.
Temp. Range oK	293-473	293-473	392-504
Ref.	41-1	41-1	ထ - - - - - - - - - -
E.io	c	0	à

Thermal Linear Expansion, percent



Thermal Linear Expansion, percent

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Thermal linear expansion -- copper + $ext{tin} + ext{Si}_{1}$

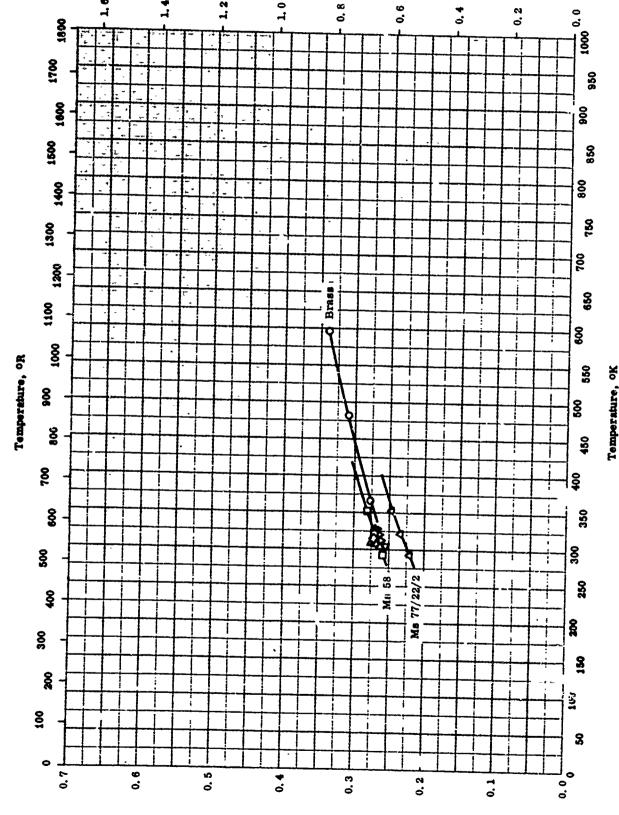
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Thermal linear expansion -- copper + $ext{tin} + ext{dx}_{ ext{I}}$

Remarks	Cast.	Same as above.	Cast, annealed at 1373 F.	Cast in green sand mold at about 2250 F.		
Sample Specifications	Sn-Zn Bronze: 88 Cu, 10 Sn, 2 Zn.	Sn-Zn Bronze: 88 Cu, 8 Sn. 4 Zn.	Sn-Zn Bronze: 86.7 Cu, 11.2 Sn, 2.1 Zn.	Sn-Zn Bronze: 86.5 Cu, 11 Sn, 2.5 Zn.	Bronze: 84.84 Cu, 14.93 Sn, and 0.21 Pb.	
Rept. Error%						
Temp. Runge ok		280-573	293-473	293-573	293-873	
Ref.	43-8	43-8	43-8	43-8	43-6	

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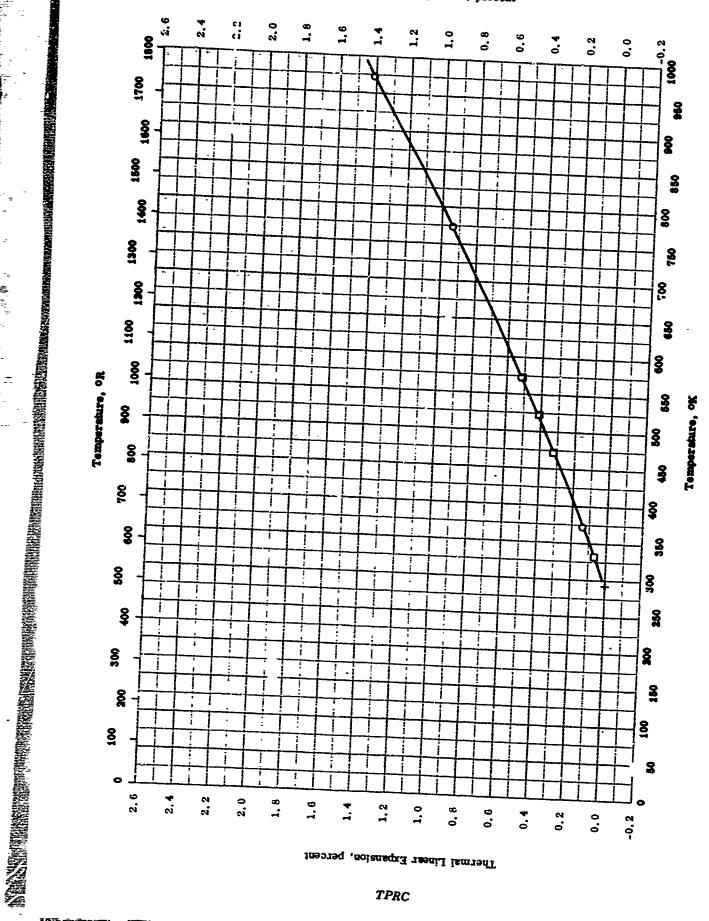
THERMAL CONDUCTIVITY -- COPPER + z_{iNC} + z_{X_i}



Thermal Conductivity, cal Sec-1 cm-1 K-1

Thermal conductivity -- copper + zinc + Σx_1

Remarks	Rod.			Annoaled for 17 hrs at 500 C at ordinary atmosphore; measured by using steel as standard.	Same as above except using Ni as standard.	Same as above except using yellow brass as standard.	Same as above except using Al as standard.	
Sample Specifications	Brass; 35, 5 Zn, 3 Pb.	Ms 53; 58.1 Cu, 39.2 Zn, 2,2 Pb, 0,3 Sn, and 0,1 Fe.	Ms 77/22/2; 77.27 Cu, 20.77 Zn, 1.96 Al, and traces of Mn and Ni.	Yollow brass; 77 Cu, 22 Zn, 4 Pb, 2 Sn.	Same as above,	Зате ая ароче.	Saine as above.	
Rept. Error%	±4		¬	es 41	e 43	es +	£ ₩	
Temp.	367603	293-353	203-353	313-328	305-325	301-320	306-318	
Ref.	51-3	58-3	58-3	60-4	60-4	60~4	60-4	
Sym Doug	0	0	٥	D	▽	Δ	\ \	

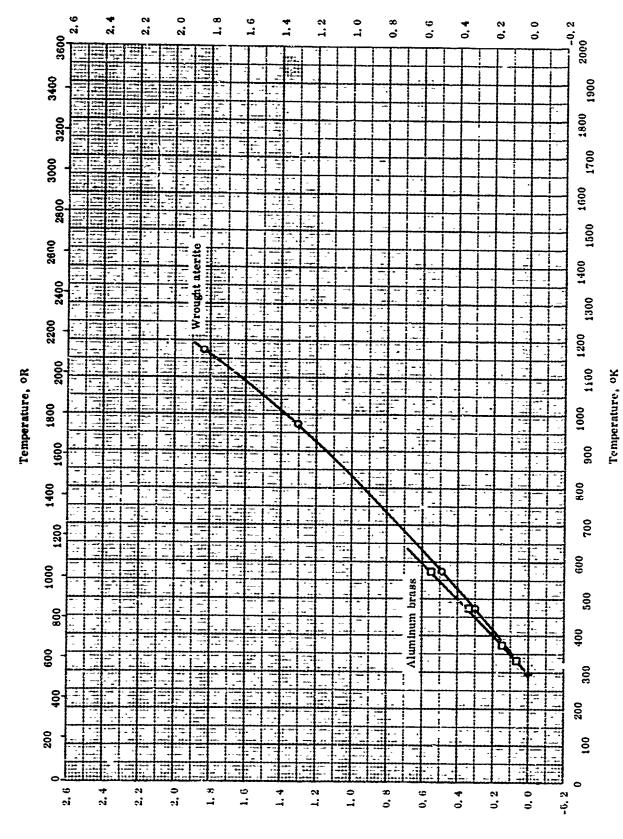


Thermal linear expansion -- copper +zinc + Σx_1 ($6 < Z_0 < 10$)

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THERMAL LINEAR EXPANSION -- COPPER + ZINC + ΣX_{i} (5 < Zn < 10)

Remarks	Cast rod.	Data average of 4 samples: quenched from 1450 F, agod 1 hr at 770 to 850 F and 18 to 40 months at room temperature; two of above cold drawn 34% efter quenching.
Sample Specifications	Red Brass: 84, 96 Cu, 6, 15 Zn, 5, 02 Sn, 4, 87 Pb,	Tollurium nickol brass; 88, 84 Cu, 9,28 Zn, 1,16 Ni, 0.52 Te, and 0.21 Pb.
Rept. Error%		
Tomp. Range ok	273-973	293-672
Ref.	43-6	9-1-1-0
Sym	0	0

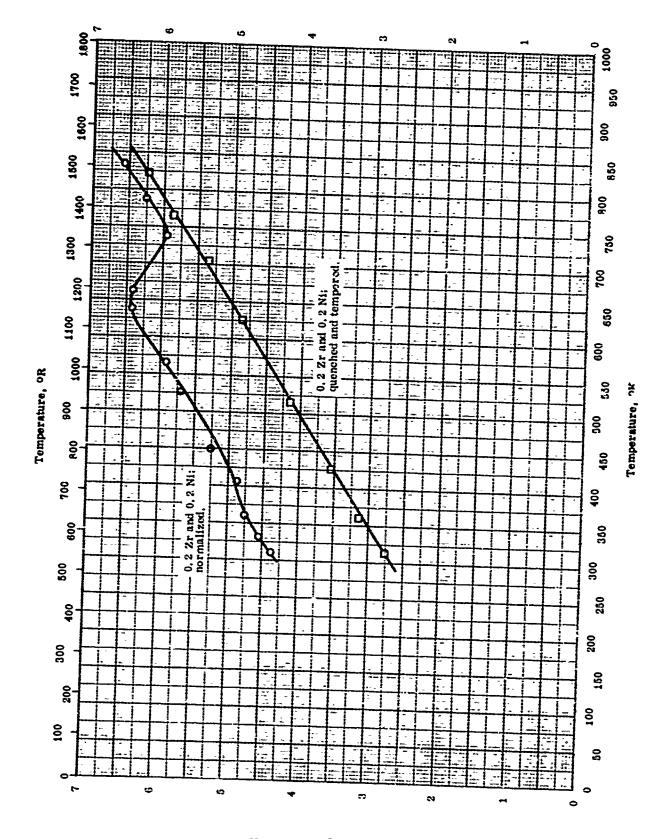


THERMAL LINEAR EXPANSION -- COPPER + ZINC + ΣX_1 (21 < Zn \leq 22)

Thermal Lirear Expansion, percent

Thermal linear expansion -- copper + zinc + ΣX_l (21 < Zn s22)

Remarks	Annouled at 1200 F.	Cold-drawn.	
Sample Specifications	Aluminum Brass; 76.60 Cu, 21.47 Zn, 1.91 Al, < 0,03 Pb, 0.02 I c.	Wrought Atorite; 68 Cu, 22 Zn, 11 Ni, 1.5 Fe, and 0.5 Mn.	
Rept. Error%			
Temp. Range ok	203-673	263-1173	
Ref.	47-6	43-6	
Sym	<u></u>	0	



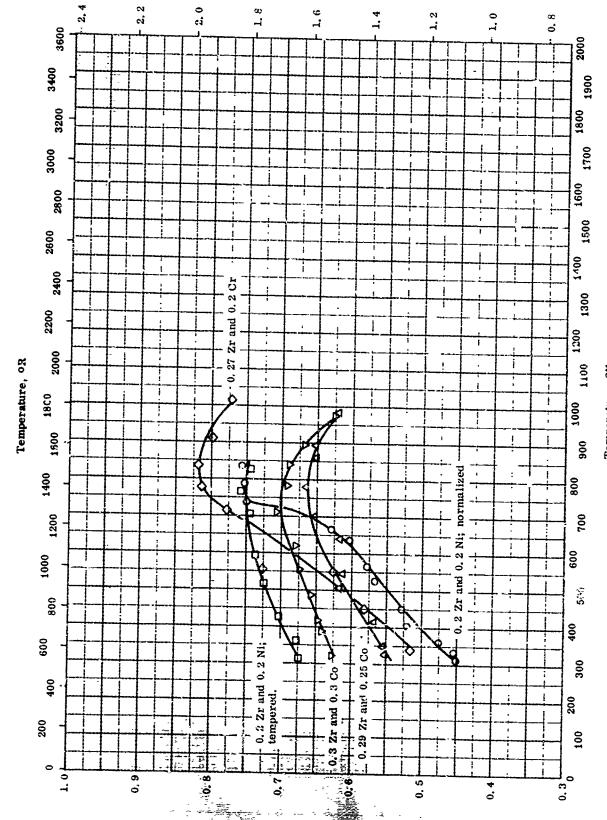
Electrical resistivity -- copper + zirconium + Σx_1

Electrical Resistivity, ohm cm x 10^{ε}

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electrical resistivity -- copper + zirconium + Σx_i

			 		 	 		_
Remarks	Normalized.	Quenched and temporeu.						
Sample Specifications	0, 2 Zr, 0, 2 N1, 0, 16 Cr, und 0, 1-0, 2 Ti.	Bame na ubove.						
Rept.								
Temp. Bunge ok		311-823						
Byf.	9-9g	9-99						
E CO	0	0		_		 		



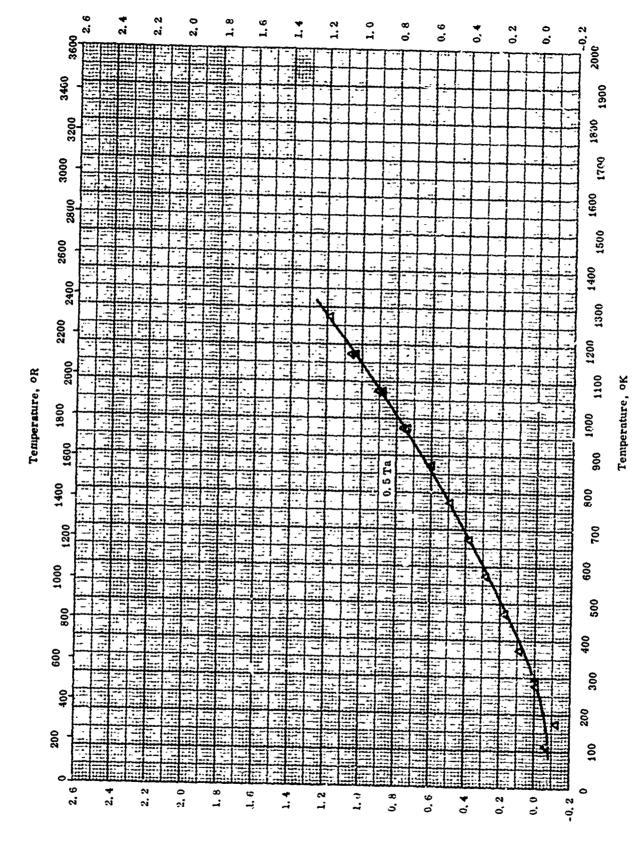
THERMAL CONDUCTIVITY -- COPPER + 21RCONIUM + ΣX_1

Thermal Condustivity, cal Sec-1 cure K-1

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THERMAL CONDUCTIVITY -- COPPER + ZIRCONIUM + ZX

Remarks	Normalized.	Tempored after quenching.				
Sample Specifications	0.2 Zr, 0.2 Ni, 0.16 Cr, and 0.1-0.2 Ta.	Same as above.	99, 26 Cu, 0 29 Zr, 0.25 Co, and 0.02 Al.	99. 40 Cu, 9. 3 Zr, and 9. 3 Co.	0, 27 Zr and 0, 2 Cr.	
Rept. Error %					-	
Temp. Range ^o K		311-835	328-982	321-972	340-101/	
Ref.	56-6	9-99	57-2	57-2	57-3	
Sym	0	0	٥	D	\(\)	



Thermal linear expansion -- Dysprosium + Tantalum + Σx_j

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- DYSPROSIUM + ANTALUM + EX

Remarks	Hoating.			The above specimen, cooling.												
Sample Specifications	99 Dy, 0.5 Ta, 0.2 Ca, 0.1 Tb, 0.05 Ho, 0.02 Er, 0.02 Sl,	0, 01 C, 0, 005 Fe, 0, 003 Nz, and no trace of Gd,		Same as above.												
Rept. Error %	1 #			#1												
Temp.	113-1273			973-1273												
Ref.	56-42	also	57-51	56-12	also	57-51						-				-
Sym Boom	٥			4			 		_	_		 	 			

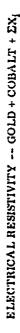
properties of gold + cobalt - Σx_i

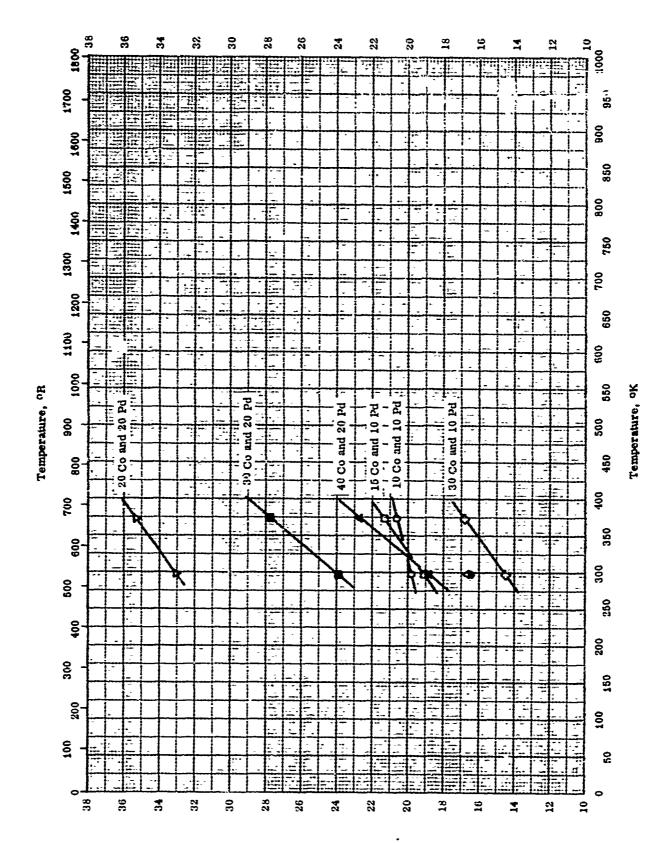
REPORTED VALUES

Melt	ing Point	К	R
0	10 Co and 10 Pd	1312	2362
	14.8 Co and 10.2 Pd	1266	2279
Δ	19.9 Co and 9.9 Pd	1296	2333
♥	30 Co and 10 Pd	1303	2346
\Diamond	20 Co and 20 Pd	1343	2418
•	40 Co and 16 Pd	1315	2367
M	30 Co and 20 Pd	1363	2454
•	40 Co and 20 Pd	1463	2634

PROPERTIES OF GOLD + COBALT + Σx_1

Remarks	Annealed in vacuum 100-150 hrs close to solidus	tomperature and slowly cooled; M. P. from break	in time-temperature curve during cooling.	Same as above.	Same as above.	Sarie as above.	Same as above,	Same as above.	Same as above.	Sanie as above.	
Sample Specifications	80 Au, 10 Co, and 10 Pd; ingredients with < 0.01 impurities.			75 Au, 14.8 Co, and 10.2 Pd; same as above.	70.2 Au, 19.9 Co, and 9.9 Pd; same as above.	60 Au, 30 Co, and 10 Pd; same as above.	60 Au, 20 Co, and 20 Pd; same as above.	50 Au, 40 Co, and 10 Pd; same as above.	50 Au, 30 Co, and 20 Fd; same as above.	40 Au, 40 Co, and 20 Pd; same as above.	
Error%											
Range OK	1312			1266	1296	1303	1343	1315	1363	1463	
<u>.</u> [56-25			56-25	56-25	56-25	56-25	56-25	56-25	56-25	
ner.	56			Š	56	50	5	26	26	99	

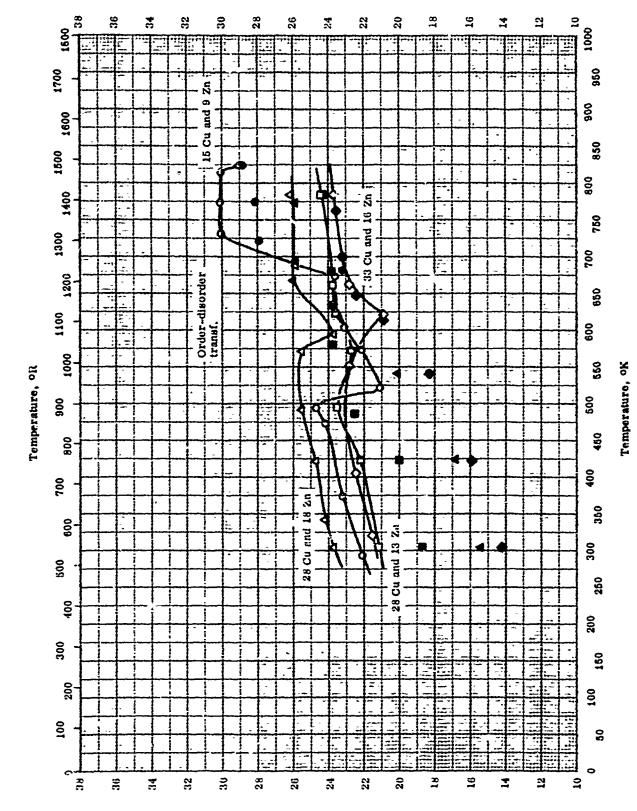




Electrical Resisitivity, ohm cm x 106

ELECTRICAL RESISTIVITY -- GOLD + COBALT + Σx_i

Kemarks	Annealed 100-150 hrs close to solidus temp. in	vacuum and cooled slowly to room temp.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above,	Samo as above.	Same as above.	
Jample Specifications	80 Au, 10 Co and 10 Pd.		75 Au, 14, 8 Co and 10 Pd.	70,2 Au, 19,9 Co and 9,9 Pd.	60 Au, 30 Co and 10 Pd.	60 Au, 20 Co and 20 Pd.	60 Au, 40 Co and 10 Pd.	60 Au, 30 Co mi 20 Pd.	40 Au, 40 Co and 20 Pd.	
Rept. Error%	_	_		-					-	
Temp.	298-373		258-373	298-373	298-373	298-373	298-373	298-373	298-373	
Ref.	5C-25		66-25	56-25	56-25	26-25	56-25	56-25	56-25	
200 200 200 200 200 200 200 200 200 200										



Electrical Resistivity, ohm cm x 106

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ELECTRICAL RESISTIVITY ... GOLD + COPPER + EX,

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ELECTRICAL RESISTIVITY -- GOLD + COPPER + EX

Remarks	Measured heating.	Measured cooling.	Monsured heating.	Measured cooling.	Mougured houting.	Mousured cooling.	Monsured heating.	Monsured cooling.	
Sample Specifications	76. 08 Au, 16. 29 Cu, and 8. 63 Zn.	Same as above.	67.3 Au, 29.4 Cu, and 13.3 Zn.	Same as above.	63, 4 Au, 28, 2 Cu, and 18, 4 Zn.	Same as above.	60. 8 Au, 32. 8 Cu, and 16. 4 Zn.	Same as above.	
Kept. Error%									
Temp.	298-823	298-823	303-783	303-783	303-783	303-783	303-783	303-783	
Ref.	8-0g	50-8	8-09	50-8	8-09	8-09	8-09	8-09	
io Se									

PROPERTIES OF GOLD + PALLADIUM + ΣX_i

REPORTED VALUES

Melt	ing Point;	К	R
0	10.1 Pd and 4.8 Co	1468	2643
0	10 Pd and 10 Co	1312	2362
Δ	20.1 Pd and 4.7 Co	1555	2799
▽	20 Pd and 10 Co	1467	26 4 1
\Q	20 Pd and 15 Co	1410	2538
Þ	30 Pd and 10 Co	1514	2725
D	20 Pd and 20 Co	1343	2418
•	40.1 Pd and 4.7 Co	1553	2796
	40.0 Pd and 10.0 Co	1473	2652
•	30.0 Pd and 20.0 Co	1466	2639
▼	45.0 Pd and 10 Co	1533	2760
•	30.1 Pd and 29.7 Co	1473	2652
4	40 Pd and 20 Co	1466	2639

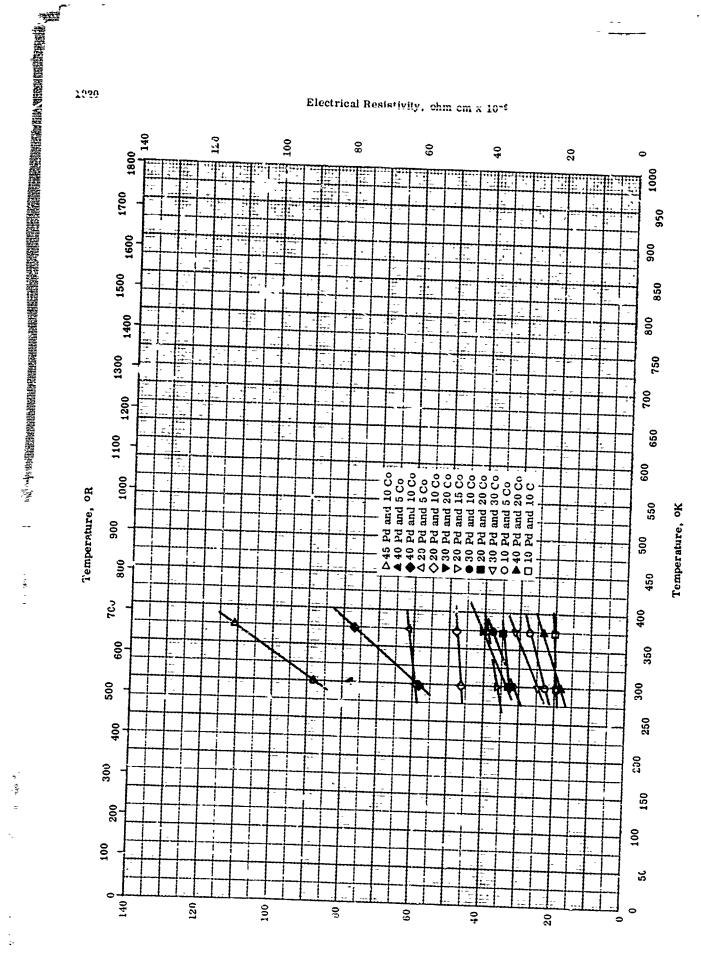
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Properties of gold + pallabium + Σx_1

Sym Som	Ref.	Tomp, Range ok	Ropt.	Sample Specifications	Remarks
0	56-25	1,468		3 0	Annealed in vacuum 100-150 hrs clese to solidus
				parities.	temperature and slowly evoled; M. P. by break in time-temperature eurve during evoling.
ם	36. 28	1312		80 Au, 10 Pd, and 10 Co; same as above.	Same as above.
4	8025	1666		76.2 Au, 20.1 Pd and 4.7 Co; same as above,	Same as above.
D	56-25	1467		70 Au, 30 Pd, and 10 Co; name as above.	Same an above.
\Q	00-20	1410		65 Au, 20 Pd, and 15 Co; name an above.	Same as above.
♥	80-25	1514		60 Au, 30 Pd, and 10 Co; same as above.	Same an above,
Δ	98-99	1343		60 Au, 20 Pd, and 20 Co; same as above,	Зате ни проче.
•	90-20	1863		16,2 Au, 46,1 Pd, and 4,7 Co; same an above.	Sanie na above.
	66-26	1473		50.0 Au, 40 Pd, and 10 Co; same us above.	Rume as above.
4	96-28	1466		60 Au, 30 Pd, and 20 Cu; same as above.	game na above.
>	20-20	1633		46 Au, 46 Pd, and 10 Co; same ra above.	Same as above.
•	26-25	1.473		40.2 Au, 30.1 Pd, and 20.7 Co; same as akeve.	Same us above.
▼	66-25	1400		40. Au, 40 Pd, nnd 20 Co; sume as abovo.	Samo na alvivo.



Electrical Pesistivity, ohm om z 10^{-6}

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ELECTRICAL RESISTIVITY -- GOLD + PALLADIUM + Σx_i

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ELECTRICAL RESISTIVITY -- GOLD + PALLADIUM + $\Sigma X_{\mathbf{i}}$

Both Ref. Flame Sample Specifications Remarks Both Ref. Flame Empty Ref. Au. 10. 1 Pd and 4. 8 Co. Amenated 100-150 hrs close to solidars temp. in vacuum; cooled slowly to room temp. 0 66-25 298-373 80 Au, 10 Pd and 10 Co. Same as above. Same as above. △ 66-26 298-373 75, 2 Au, 20. 1 Pd and 4.7 Co. Same as above. Same as above. △ 66-26 298-373 60 Au, 20 Pd, and 10 Co. Same as above. Same as above. ▼ 66-26 298-373 60 Au, 20 Pd and 10 Co. Same as above. Same as above. ▼ 66-26 298-373 60 Au, 40 Pd and 10 Co. Same as above. Same as above. ▼ 66-26 298-373 60 Au, 40 Pd and 20 Co. Same as above. Same as above. ▼ 66-28 298-373 60 Au, 40 Pd and 20 Co. Same as above. Same as above.																	
Ref. Temp, Error % Röpt. 56-25 298-373 85.1 Au, 10.1 Pd am 56-25 298-373 75.2 Au, 20.1 Pd am 56-25 298-373 75.2 Au, 20.1 Pd am 56-25 298-373 70 Au, 20 Pd and 10 56-25 298-373 60 Au, 20 Pd and 10 56-25 298-373 60 Au, 20 Pd and 10 56-25 298-373 60 Au, 20 Pd and 10 56-25 298-373 50 Au, 40 Pd and 10 56-25 298-373 50 Au, 40 Pd and 10 56-25 298-373 40 Au, 40 Pd and 10 56-25 298-373 40 Au, 40 Pd and 10 56-25 298-373 40 Au, 40 Pd and 20 56-25 298-373 40 Au, 40 Pd and 20	Remark3	Annealed 100-150 hrs close to soliavs temp. in vacuum; cooled slowly to room temp.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.			
Ref. Temp, Error % Röpt. 56-25 298-373 85.1 Au, 10.1 Pd am 56-25 298-373 75.2 Au, 20.1 Pd am 56-25 298-373 75.2 Au, 20.1 Pd am 56-25 298-373 70 Au, 20 Pd and 10 56-25 298-373 60 Au, 20 Pd and 10 56-25 298-373 60 Au, 20 Pd and 10 56-25 298-373 60 Au, 20 Pd and 10 56-25 298-373 50 Au, 40 Pd and 10 56-25 298-373 50 Au, 40 Pd and 10 56-25 298-373 40 Au, 40 Pd and 10 56-25 298-373 40 Au, 40 Pd and 10 56-25 298-373 40 Au, 40 Pd and 20 56-25 298-373 40 Au, 40 Pd and 20															=		
Ref. Temp. 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373			80 Au, 10 Pd and 10 Co.	75, 2 Au, 20, 1 Pd and 4, 7 Co.	70 Au, 20 Pd and 10 Co.	65 Au, 20 Pd, and 15 Co.	60 Au, 30 Pd and 10 Co.	60 Au, 20 Pd and 20 Co.	55.2 Au, 40.1 Pd and 4.7 Co.		50 Au, 30 Pd and 20 Co.	45 Au, 45 Pd and 10 Co.	40. 2 Au, 30. I Pd and 29. 7 Co.	40 Au, 40 Pd and 20 Co.			
Ref. Temp. 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373 56-25 298-373	Rept. Error%																
S6-25 56-25 56-25 56-25 56-25 56-25 56-25 56-25 56-25		298-373	298-373	298-373	298-373	298-373	298-373	298-373	298-373	298-373	298-373	298-373	299-373	298-373			
			56-25	56-25	56-25	56-25	56-25	56-25	56-25	56-25	56-25	56-25	56-25	56-25			
	Sym	0	0	4	♦	D	•		4	•	•	Δ	▽	A			

PROPERTIES OF LANTHANUM + MAGNESIUM + ΣX_i

REPORTED VALUES

Density:	g cm ⁻³	1b ft-3
1.0>Mg and 0.42 Fe	6.07	379
Melting Point:	к	R
0 1 02 Mg and 0 55 Fe	1152	2074

₹.

Properties of Lanthanum + magnesium + Σx_1

REFERENCE INFORMATION

Remarks		Cast
Sample Specifications	98 La, 1.02 Mg, 0.55 Fe, and 0.05 S.	1.0 > Mg, 0.42 Fe, 0.625 Ca, and 0.01 > other rare earth; 67 % hexagonal close packed phase and 33%face centered cubic phase.
Rept. Error %		
Temp. Range ^O K		88
Ref.	6-84	11-69
Sym	0	ם

PROPERTIES OF MAGNESIUM + ALUMINUM + ΣX_i

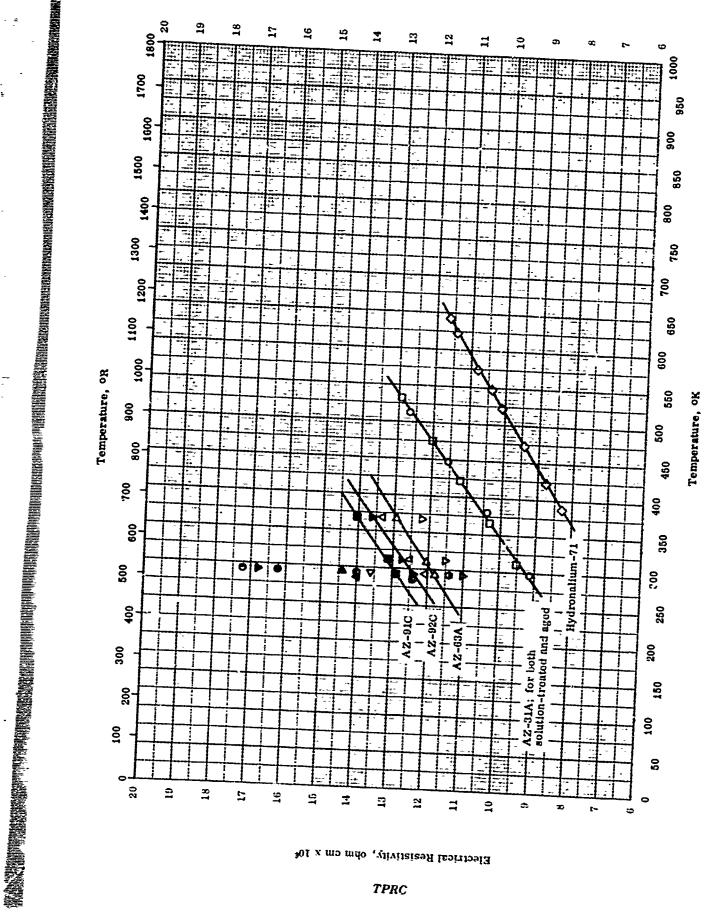
REPORTED VALUES

Density .	g cm	lb ft ⁻³
O AN-M-29	1.78	111
Melting Point	К	R
☐ AZ 31A and B	838	1508
Heat of Fusion	cal g ⁻ⁱ	Btu lb-1
Δ AZ31A and B	81 ± 2	146 ± 4

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Properties of magnesium + aluminum + Σx_i

٠				
Remarks	Hot-rolled, annealed 1 hr at 600 F, and fr.rnace cooled.			
Sample Specifications	An-M-29; 95.7 Mg, 3 Al, 1.0 Zn, and 0.3 Mn; nominal composition.	AZ31 A and B; 95.9 Mg, 3.0 Al, 1.0 Zn, and 0.5 Mn; nominal composition.	Same as above.	
Ropt. Error%				
Temp. Range ok	293	838	838	
Ref.	58-1	57-18	57-18	
Sym Pog	0	ם	٥	



Electrical resistivity -- magnesium + aluminum + Σx_1

Electrical Resistivity, ohm cm z 10^4

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ELECTRICAL RESISTIVITY -- MAGNESIUM + ALUMINUM + \(\Sigma \)

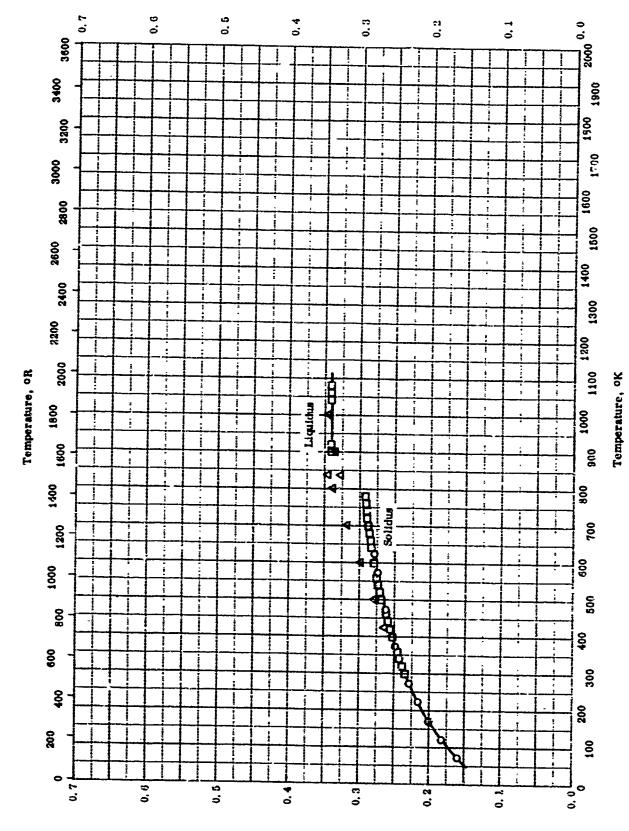
Sym Som	Ref.	Temp. Range ok	Rept. Error%	Sample Specifications	Remarks
0	5620	297-616		AZ 31A: 3 19 A1 1 07 Zn 0 49 Mn 0 16 Cn 0 01 5 mmh Si	Chat. Mattad anomy to the and man hadeness day
	;			Sn, 0,0044 Fe, 0,001 Cu, 0,001> Pb, and 0,0005> Ni.	fabricated" and solution heat treated specimens;
					max, deviation from average is ± 0, 025x 10.6
					ohn cm.
α	67-18	292-533		Magnessium Alloy AZ31A and B; 95.5 Mg, 3.0 Al, 1.0 Zn, and 0.5 Mn.	Cust and wrought; in two conditions as fabricated and solution heat treated.
4	67-18	203-367		Mugnosium Alloy AZ63A; 90, 8 Mg, 6, 0 Al, 3, 0 Zn, and 9, 2 Mn.	As fabricated.
•	57-18	293-307		Same as above.	Solution heat treated.
D	67-18	293-367		Same as above,	Aged.
Δ	57-18	293-367		Same as above.	Solution heat treated and aged,
⊽	67-18	293-367		Magnesium Alley AZ91C; 90.4 Mg, 8,7 Al, 0,7 Zn, and 0,2 Mn.	As fabricated.
•	81-19	293-367		Same as above.	Solution heat treated.
	57-18	203-367		Same as above.	Solution heat treated and aged,
4	57-18	293-367		Mugnosium Ailoy AZ92A; 88, 8 Mg, 9, 0 Al, 2, 0 Zn, and 6, 2 Mn.	As fabricated.
•	67-18	293-367		Same as above.	Solution heat treated,
>	57-18	203-307		Same as above.	Same data for 2 samples: cample (a) aged and sample (b) solution heat treated and aged.
A	57-18	203		Magnosium Alloy AM 100A; 89.8 Mg, 10.0 Al, and 0.2 Mn.	Cast.
				(Continued onto next page)	

ELECTRICAL RESISTIVITY -- MAGNESIUM + ALUMINUM + EX. (continued)

REFERENCE INCOLMATION

T				
Remarks	Solution heat-treated.	Solution heat-treated and aged.	Tompor T61.	
Sample Specifications	Same as abovo.	Вите им акте.	Same as above.	Hydronalium - 71 (German Dasign.); nominal composition: 7 Al and 1 St.
Rept. Error %				
Temp. Range ok	203	203	203	440-683
~		<u> </u>		
Ref.	57-18	67-18	67-18	1-04

SPECIFIC HEAT -- MAGNESIUM + ALUMINUM + EX

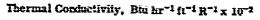


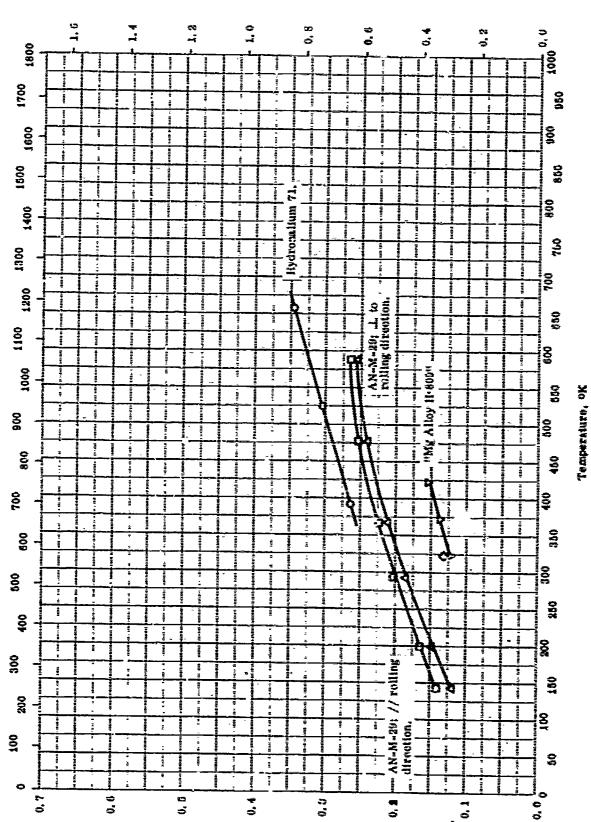
Specific Heat, cal g" K"

SPECIFIC HEAT -- MAGNESIUM + ALUMINUM + ΣX_1

Remarks	Annealed 1 hr at 600 F and furnace cooled; scaiced under hellum atmosphere.	Under hellum atmosphere.	Machined from permanent mold cast material.
Sample Specifications	AN-M-29; 95, 7 Mg, 3, 9 Al, 1, 9 Zn, and 9, 3 Mn; density 112 lb ft ⁻³ at 32 F.	Magnessium alloy AZ-80; 8, 0 Al, 0, 55 Zn, and 0, 14 Mn.	Mg alloy AZ-31B; 95, 5 Mg, 3, 0 Al and 0, 5 Mn.
Rept.		0. 0-3	
Temp. Range ok	110-590	280-1080	425-838
Ref.	58-1 nlso 54-13	61-18	67-18 06-17
E S	0	0	₫







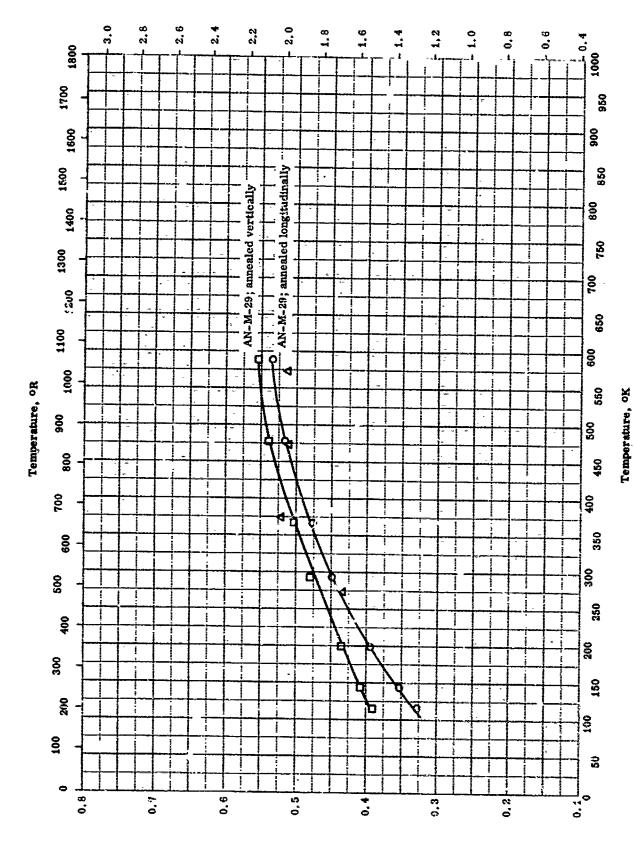
Temperature, oR

THERMAL CONDUCTIVITY -- NACHESTUM + ALUMINUM + EX

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THERMAL CONDUCTIVITY -- MAGNESIUM + ALUMINUM + ΣX_i

Remarks	Cast at 700 C into molds at 200 C, rolled and drawn, and then turned into rolls; radiation less than 5%.	Annealed 1 hr at 1600 F and furnace cooled; measured parallel to the rolling direction.	Same as above except measured normal to rolling direction.	Sand-cast and solution treated	Same as above; second run.	
Sample Specifications	Hydronallun: 71 (Gorman design.); 97 Mg, 7 Al, and 1 Si; nominal composition.	AN-M-29 (Dow Chem. Co.); 95.7 Mg, 3 Al, 1 Zn, and 0.3 Mn; density 111 lb ft-3.	Same as above.	H-809; 9 A1, 0.5 Zn and 0.3 Mn.	Same as above.	
Rept. Error %						
Temp. Range ^O K	393-658	145-589	145-589	323-423	323	
Ref.	40-1	28-1	58-1	64-3	643	
Y Soin	0	۵	0	D	 	



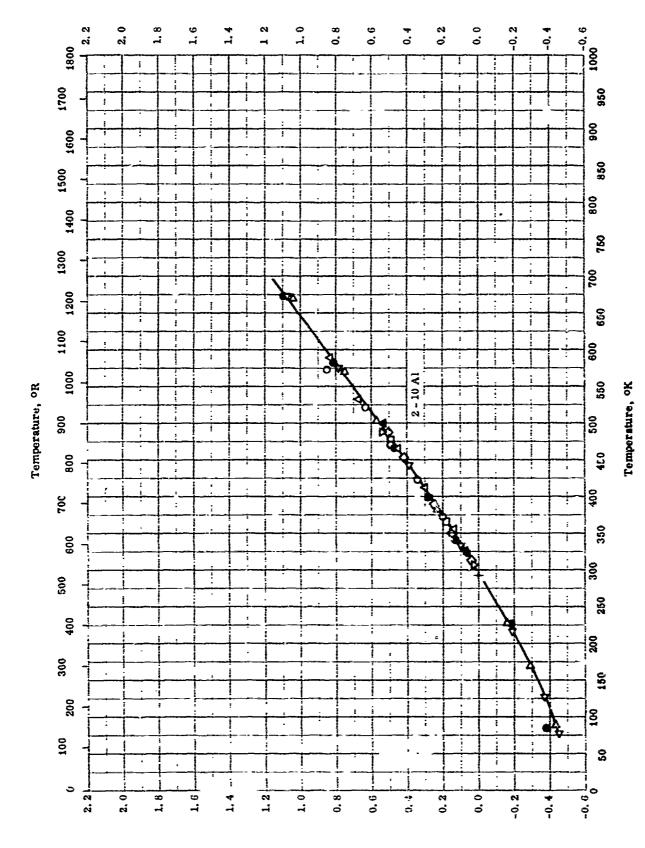
THERMAL DIFFUSIVITY -- MAGNESIUM + ALUMINUM + DX

Therral diffusivity, cm2 Sec-1

THERMAL DIFFUSIVITY -- MAGNESIUM + ALUMINUM + \(\Sigma\)

REFERENCE INFORMATION

Remarks	Not rolled; annealed longitudinally at 315 C for 1 hr and furnace cooled.	Same as above except annealed vertically.	Annealed	
Sample Specifications	AN-M-29; 2, 5-3, 5 / 1, 0, 7-1, 3 Zn, 0, 3 max Si, 0, 2 min Mn, 0, 05 max Cu, 0, 095 max Ni, and 0, 005 max Fe, and 0, 3 max others.	Same ne above	AN-M-29; 3.5 Al. 1.3 3n, 0.3 Sl, 0.2 min Mn, 0.05 Cu, 0.005 Fe, and 0.005 Ni.	
Rept. Error %				
Terrer. Range OK		116-589	272-573	
Ref.	58-1	58-1	56-1	
Sym	0	۵	۵	



THERMAL LINEAR EXPANSION -- MAGNESIUM + ALUMINUM + EX

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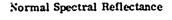
Thermal Linear Expansion, percent

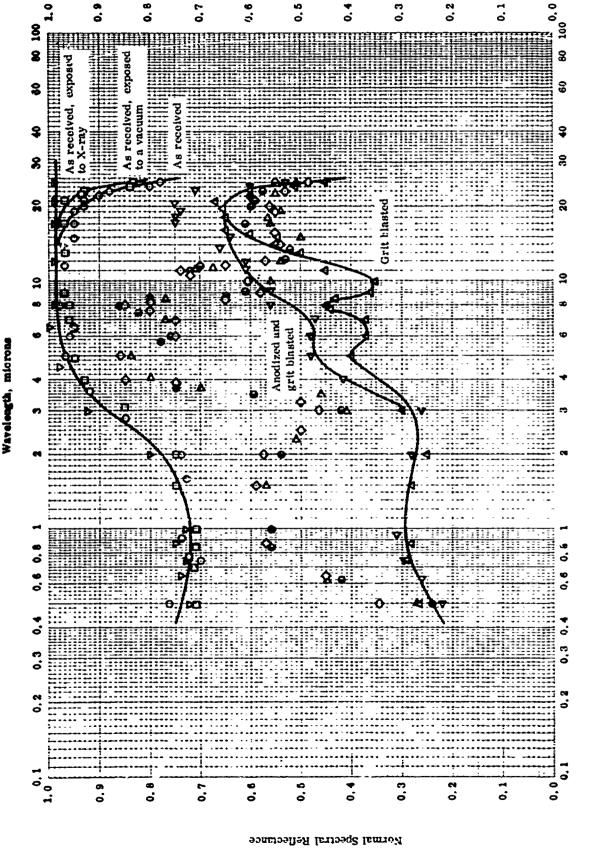
Thermal linear expansion -- magnesium +aluminum + $\Sigma \mathbf{x_l}$

	his	ent		r each		rec- min-i	
Remarks	Sample tested in the as fabricated condition; this composition fits a nominal Mg Alloy AZ63A.	Cast; solution heat treated; expansion coefficient for AZ81 given as (15, 04 \pm 0, 15) x 10 ⁻⁶ F ⁻¹ .	Cast; solution heat treated.	Plotted average of 4 samples, 2 conditions for each alloy, all within ±0.4%; a) as cast. ; cast and solution heat treated.	Plotted average of 4 samples within ±2 %; a) as fabricated, b) aged, c) solution heat treated, d) solution heat treated and artificially aged,	Hot rolled, annealed 1 hr at 600 F, and furnace cooled; measured perpendicular to rolling direction in argon with heating rate at 1.5-2.5 C min";	
Sample Specifications	6.02 Al, 3.10 Zn, 0.26 Mn, 0.017 Fe, 0.01>cach Ca, Si, Sn, 0.002 Cu, and 0.001>cach Ni, Pb.	Mg Alloy AZ81; nominal: 7.0-8.1 Al, 0.4-1.0 Zn, 0.3 max Si, 0.13 min Mn, 0.10 max each Cu, Ni, and 0.3 max others.	Mg Alloy AX81XA; 8. 00 Al, 0. 76 Zn, 0. 21 Mn, 0. 01 St, 0. 01> cach Ca, Sn, 0. 003 Pb, 0. 001 Fe, and 0. 001> cach Cu, Ni.	2 sampless: a) AZ31A; 3.12 Al, 1.07 Zn, 0.49 Mn, 0.16 Cn, 0.01>each Sl, Sn, 0.0044 Fe, 0.001 Cu, 0.001> Pb, 0.0005 > Ni. b) AZ31B; 3.14 Al, 1.05 Zn, 0.49 Mn, 0.01>each Ca, Sl, Sn, 0.0047 Fe, 0.001>each Cu, Pb, and 0.0005 > Ni.	Mg Alloy AZ63A; 6.02 Al, 3.10 Zn, 0.26 Mn, 0.017 Fe, 0.01> each Si, Sn, Cn, 0.002 Cu, and 0.001>each Ni, Fb.	Mg Alloy AN-M-29; 2.5-3.5 Al, 0.7-1,3 Zn, 0.3>Si, 0.2> Mn, 0.05>Cu, 0.005>each Ni, Fe, and 0.03>others.	
Rept. Error %							
Temp. Range ok	373-573	293-478	298-488	300-489	300-589	83-678	
Ref.	54-29	54-19	55-17	55-17	55-17	51-6 also 58-1	
Sym	0	D	D	♦	٥	Δ	

THERMAI LINEAR EXPANSION -- No. 13SIUM + ALUMINUM + EX. (Continued)

Remarks	Same heat treatment as above; measured parallel	to rolling direction.	Same heat treatment as above; measured across		Plotted average of 2 samples within ± 0.1%: a) cast and aged. b) cast, solution heat treated, and artificially aged.	
Sample Specifications	Same as above.		Samo as above.		Mg Alioy AZ92A; nominal: 8.3-9.7 Al, 1.6-2.4 Zn, 0.10< Mn, Plotted average of 2 ramples within ± 0.1%: 0.3 > Si, 0.1 > Cu, 0.01 > Ni, and 0.3 > others. b) cast, solution heat treated, and artificial	
Rept. Err 3r %						
Temp. Range ok	83-678		83-678		205-489	
Ref.	51-6	also 58-1	51-6	28-1	55-17	
Sec.	▽		•		4	





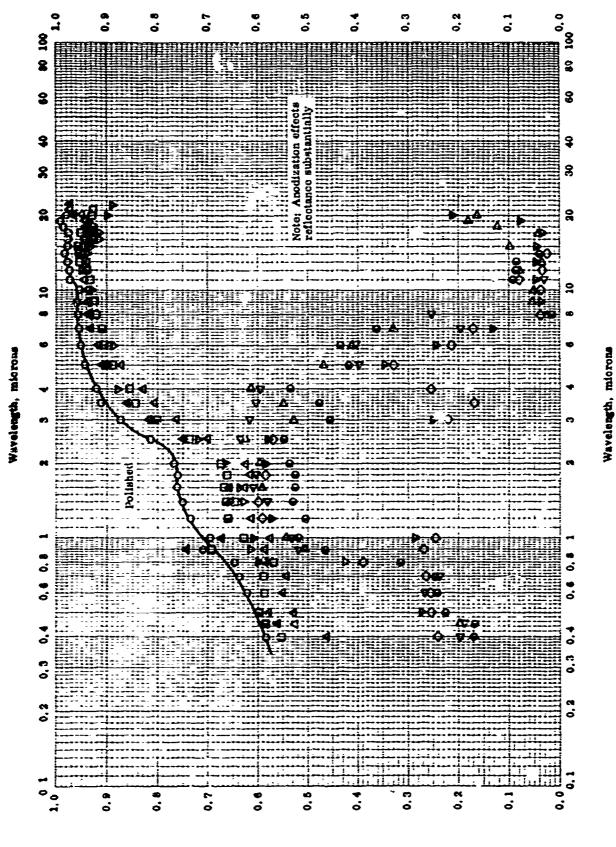
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NORMAL SPECTRAL LEFLECTANCE -- MAGNISSUM + ALUMINUM + XI, (Mg alloy AZ31)

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NORMAL SPECTRAL REFLECTANCE -- MAGNESIUM + ALUMINUM + EX₁ (Mg alloy AZBA)

Remarks	As received,	As received and grit-blasted.	As received and exposed to a vacuum of 4×10^{-6} mm Hg for 24 hrs.	As received and exposed to x-ray in a vacuum of 4 x 10 ⁻⁸ mm lig vacuum.	Anodized in HAE.	Anodized in NAE and grit-blasted.	Anothred in NAE and exposed to a vacuum of 4x 10 ⁻⁶ mm Hg for 24 hrs.	Anodized in IIAE and exposed to x-ray in a vacuum of 4 x 10 ⁻⁸ mm lig for 24 hrs.	
Sample Specifications	MKAZ31; 3 A1, 1 Zn and 0,2 Mn.	MK AZUL.	MR AZDI.	MK AZUL.	MR AZ31.	Mg AZ31.	Mg Azul.	Mg A231,	· · · · · · · · · · · · · · · · · · ·
Kept. Error%									
Wavelength Range, µ	<u> </u>	0, 50-25, 0	0, 60-25, 0	0, 50-25, 0	0, 50-26, 0	0, 50-25, 0	0, 50-25, 0	0 20-58 0	
Temp. oK	208	808	x aaa	208	802	208	888	868	
Ref.	62-23	62-23	25 25 25	82-29	02-23	62-23	62-23	62-25	
Bym	0	٥	0	Þ	\(\)	∇	Δ	•	



NORMAL SPECTRAL REFLECTANCE --- MAGNESIUM + ALUMINUM + EXI (Mg AZ31B and MgAZ31B anodized in Dow 17)

Normal Spectral Reflectance

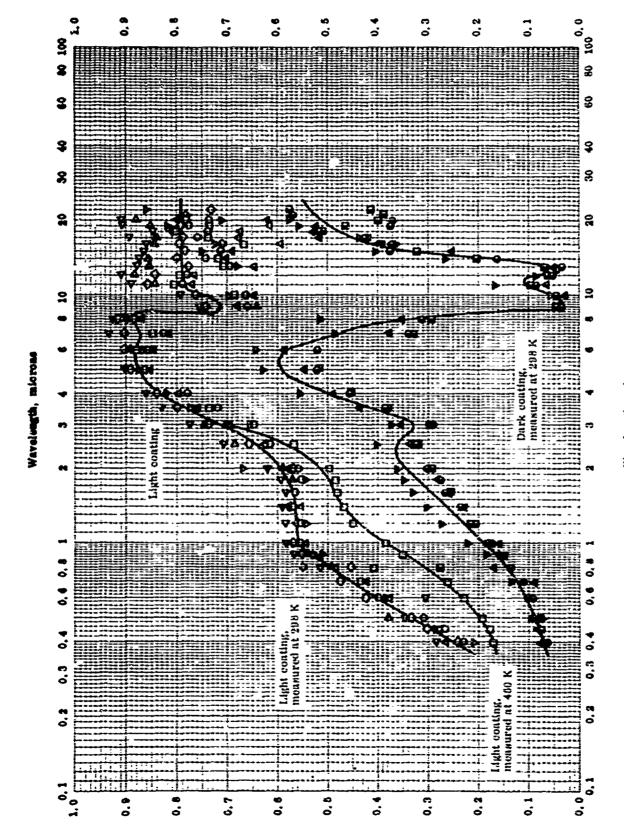
TPRC

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NORMAL SPECTRAL REFLECTANCE -- MAGNESIUM + ALUMINUM + EXI (Mg AZ31B and MgAZ31B anodized in Kow 17)

4

Sym Doi:	Ref.	Temp, ^o K	Wavelength Range, µ	Rept.	Sample Specifications	Romarks
0	01-22	208	0.4-20.0		96. 5 Mg, 3 A), 1 Zn, and 0, 46 Mn.	Mechanically polished; in 10-5 mm lig vacuum.
٥	61.22	208	0, 4-21, 0		96, 5 Mg, 3 Al, 1 Zn, and 0, 45 Mn.	Mechanically and electropolished; anodized in Dow 17, light coating; in 10-5 mm lig vacuum,
0	61-22	450	0, 4-21.0		Samo as above.	Same as above.
Þ	61-22	288	0, 4-22, 0		Same as above.	Same as above.
♦	01-22	7. 6.	0,4-14.0		96. 5 Mg, 3 Al, 1 Zn, and 0. 46 Mn.	Mechanically and electropolished; anodized in Dow 17, dark coafing.
▽	61-22	460	0.4-11.0		Same as above.	Same as above.
Δ	61-22	208	0,4-20,0		Same as above.	Same as above.
•	61-22	208	0, 4~14, 0		Same as above.	Sume 3s above, after heating in air at 700 K.
4	C1-23	208	0, 4-22, 0		us, 5 Mg, 3 A1, 1 Zn, and 0, 45 Mn.	Nicehanically polished; anodized in Dow 17, light conting; in 10 ⁻⁶ mm lig vacuum.
9	01-22	ROS	0, 4-20, 0		Same no above.	The above specimen mill finished, anolized in Dow 17, light coating; 10 ⁻⁵ mmlig vacuum.
>	22-23	208	0, 4-29, 0		96, 6 Mg, 3 Al, 1 Zn, and 0, 46 Mn.	Machanically polistered, anodized in Dow 17, dark conting; in 10 ⁻⁵ mm Hg vacuum.



Wavelength, miorona

NORMAL, SPECTRAL, REFLECTANCE -- MAGNESIUM + ALUMINUM + Σx_i (MK Alloy - AZ 3113 Anglized in HAE)

Normal, spectual, reflectance -- magnesium + aluminum + Σx_1 (Me alloy - A2 11B anolized in IIAE)

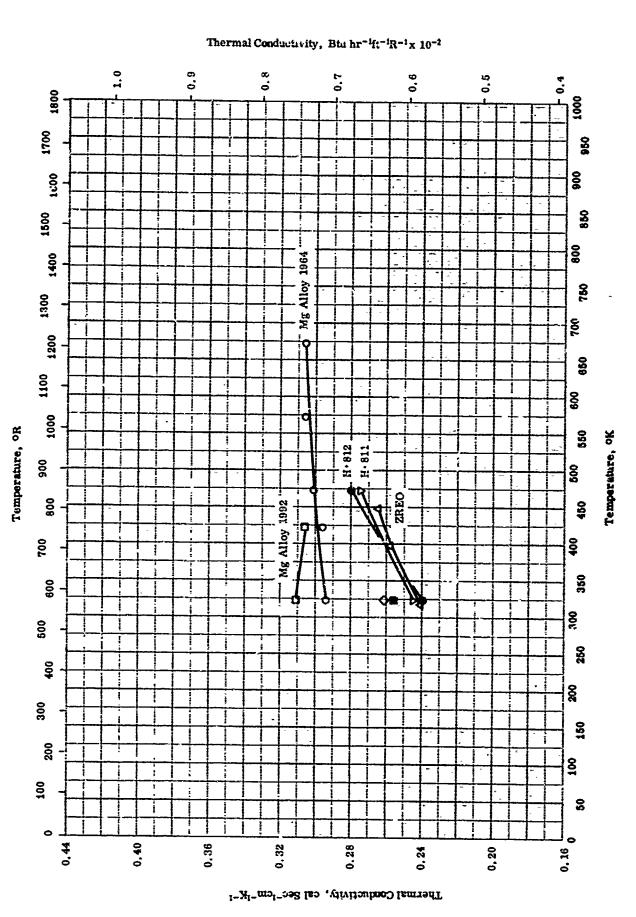
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Hof.	П	Temp. ^o K	Wavalength Range, µ	Rept. %	Bample Specifications	Remarks
61-22		80 00	0.4-20.0		96.6 Mg. 11 Al, 1 Zn, and 0, 46 Mn.	Mechanically and electropolished: anodized in IIAE, light coating; measured in vacuum of 10° 5 mm Hg.
61-22		024	0,4-20,0		Same as above,	Same as above.
ZZ-19		208 208	0,4-20,0		Same no obses.	The above specimen heated in air at 706 K for 30 min.
61-22		***************************************	0.4-22.0		Samo an abovo.	The above specimen after previous high temperature run.
######################################		× 07	0,4-22,0		96, 6 Mg. 9 Al. 1 Zn, and 0, 46 Mn.	Mechanically and electropolished, anodized in HAE, light sonting: in 10"5 mm Hg vacuum.
61-22		208	0,4-72,0		95, 5 Mg. 3 Al. 1 Zn and 0, 45 Mn,	Mechanically pollabed, anotized in HAE, light conting, measured in vacuum of 10° 5 mm 11g.
27 7 2		802	0,4-20,0		Same an above.	The above specimen mill fulshed; anodized in HAE, light conting; measured in vacuum of 10° 5 mm Hg.
7 7 1 0		***	0,4-22,0		96. f Mg, 11 Al, 1 Zn, and 0, 46 Mn.	Mechanically pollabed, anotized in HAE, dark conting; measured in vacuum of 10" 4 mm Hg.
61-22		204	0.4-20.0		Same no above, (continued on to next page)	The above specimen heated in air at 700 K for 50 min,

NORMAL SPECTRAL REFLECTANCE -- MAGNESIUM \div ALUMINUM $+ \Sigma x_1$ (continued) (Mg Alloy - AZ 31B Anodized in HAE)

SFERENCE INFORMATION

Remarks	The above specimen mill finished; anodized in HAE, dark coating; measured in vacuum 10.5 mm Hg.	Mechanically and electropolished; anodized in HAE, dark coating, measured in vacuum of 10^5 mm Hg.	
Sample Specifications	Same as above.	95.5 Mg. 3 Al, 1 Zn, and 0,45 Mn.	
Rept. Fror %			
Wavelength Range, µ	0.4-22.0	0.4-20.0	
Temp. °K	298	8000	
Ref.	61-22	61-22	
100 100 100	B	Þ	



Thermal conductivity -- magnesium + cerium + Σx_1

THERMAL CONDUCTIVITY -- MAGNESIUM + CERIUM + EX

Remarks	Machined.	Machined,	Cast; heat treated 16 hrs at 180 C.	Sand-cust,	Second run of above sample,	Sand-cast.	Second run of above sample.	•
Sample Specifications	Mg Alloy 1964; 4. 62 Co, 2. 02 Co, and 0. 75 Mn; Ce in form of mischmetal; Mg contained ≈0. 033 Al and ≈0. 012 Zn.	Mg Alloy 1992; 4.45 Co and 2.98 Co; ruw material same as above.	ZREO; 2.75 Ce, 0.7 Zr, and 0.5 Zn; Ce in form of misch-metal.	II. 811; 2. 5 Ca, 2. 5 Zn, and 0. 7 Zr; Co in form of mischmotal.	Same as above.	H. 812; 3 Ce and 0, 7 Zr; Ce in form of mischmetal.	Same as above.	
Rept. Error%								
Temp. Range OK	323-073	323-423	318-448	323-473	323	323-473	323	
Ref.	64-3	64-3	64-3	6.4-3	64-3	64-3	64-3	
Sym	0	ם	٥	Þ	\Q	•		

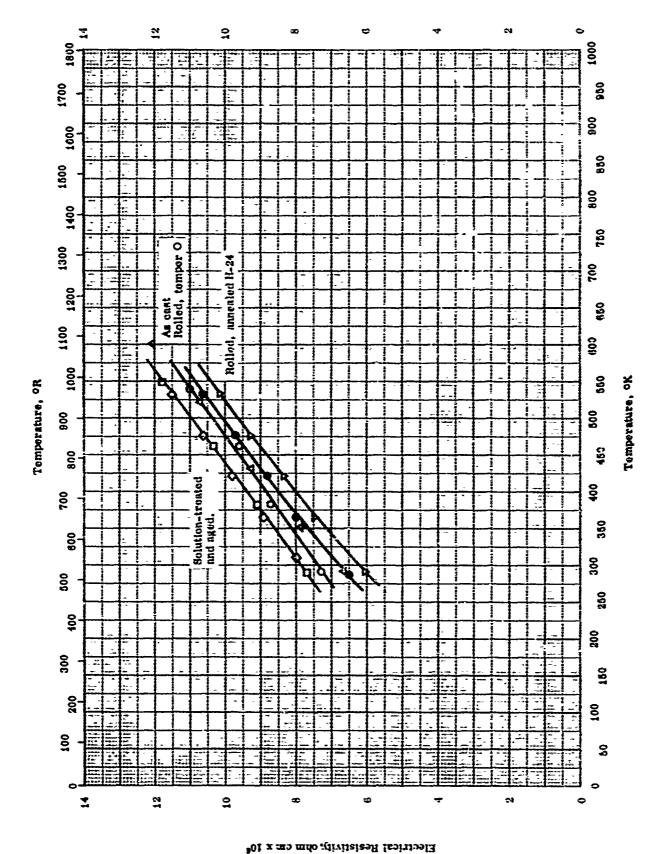
properties of magnesium + thorium + Σx_1

REPORTED VALUES

Melting Point:	K	R
0 3.0 Th and 0.7 Zr	861	1550
▼ 2.0 Th and 0.5 Min	878	1580
Heat of Fusion:	cal g ⁻¹	Btu lb ⁻¹
• 3.0 Th and 0.7 Zr	78 ± 2	140 ± 4
▼ 2.0 Th and 0.5 Mn	82 ± 2	148 ± 4

PROPERTIES OF MAGNESTUM + THORIUM + EX

Banurks					
Sample Specifications	Mr. Alloy HK 31A; 3.0 Th, 0.7 Zr, 0.08>Mn, 0.03 > Al, 0.02 > Zn, 0.01>each Ca, 81, and 8n, 0.006 x Fe, 0.005 > Cu, and 0.001 > NI and Pb.	Same as above.	Mg Alloy HM 21 XA; 2.0 Th, 0.5 Mn, 0.03>Al, 0.05 > Fe, 0.01> ench 8l, 8n, and Cn, 0.005 > Cu, and 0.00 > 165 Ni and Pb.	Same as above.	
Rept.		-			
Temp. Isnnge oK	861	801	878	878	
Ref.	67-18	67-18	67-18	67-18	
Sym Dod	0	•	D	•	



ELECTRICAL RESISTIVITY -- MAGNESIUM +THORIUM +EX₁ (Alloy IK-31)

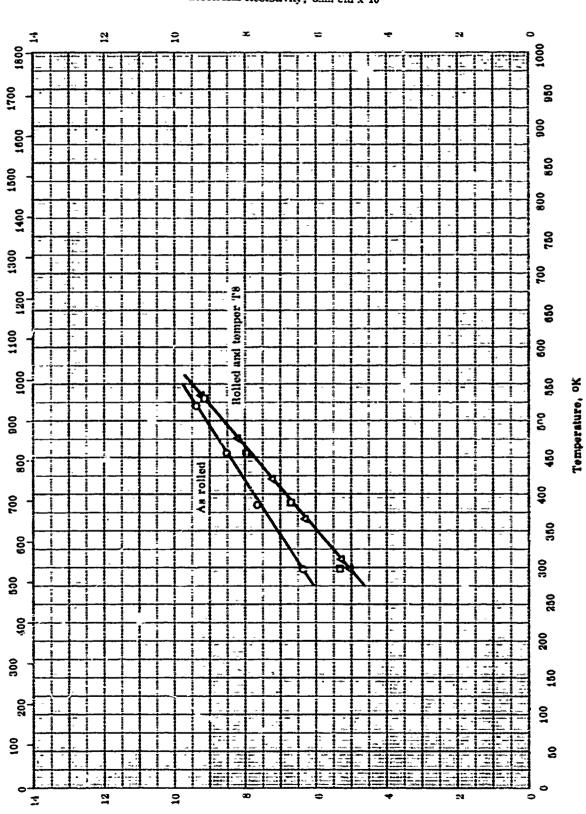
TPRC

ELECTRICAL RESISTIVITY -- MAGNESIUM + THORIUM + EX. (Alloy 11K-31)

Romarka	As anst; plotted points show average (within 2.8%) of 2 samples.	Solution hant tranted with and withcast aging; platted paints show average (within 0.6%) of 3 sumples.	Willed sheet, umealed to II-24 condition.	Cust, solution heat-treated, and aged.	Rollen'; temper 11-24.	Rolled; temper O.	
Sample Specifications	Mg nlloy HK 31XA; 3, 16 Th, 0,71 Zr, 0,064 Mn, 0,03 > Al 0,02 Zn, 0,01> each Ca, 31, 8n, 0,005 > Cu, 0,002 Fe, and 0,001 > each Mi, Pb.	Sume as adove.	Mg niley HK 31XA; 2,77 Th, 0,62 Zr, 0,032 Mn, 0,035 Al, 0,02 > Zn, 0,01 > cach Ca, 8i, 8n, 0,003 > Cu, 0,001 Ye, and 0,001 > cach Ni, Pb.	Mugnestum alloy 111: 31 A; 96,3 Mg, 3.0 Th, and 0.7 Ze.	Same an above.	Вате ня проче,	
Rapt.							
Temp.	297-640	207-648	203-601	203-633	203-633	293-633	
Ref.	02-99	56-20	66-20	81-18	67-18	57-18	
E CA	0	D	٥	\(\)	Þ	•	

Electrical resistivity -- magnesium + thorium + Σ_{X_1}

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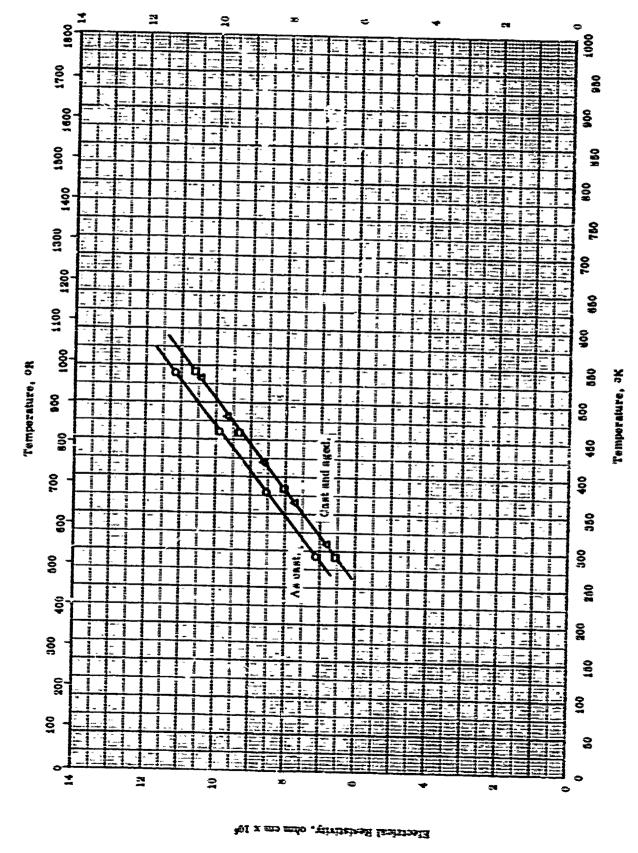


Temperatura, of

Electrical Realstivity, ohm cm x 10^4

ELECTIUCAL RESISTIVITY ... MAGNESIUM + THORIUM + 5X₁ (Alloy RM-21XA)

E S	0	C	٥	
Rof.	56-20	02-99	57-18	
Tomp.	208-021	207-031	200-000	
Rept.				
Kampla Specifications	Mg alloy HM-21XA12,22 fh, 0.69 Mn, 2.03 > Al, 0.021 Fo, 0.02 > Zn, 0.01 > each Ca, 8n, 0.006 > Cu, 0.001 > each 19b, 8l, and 0.0005 > Ni,	Same as above.	Magnerium alloy IIM-21XA: 07,6 Mg. 2,0 Th, and 0,6 Ma,	
Remarks	Rolled sheet as sabrivated; plotted pts. show aver- uge values (within 1, 6%) of 6 saxiviles.	Rolled sheat, hard "nnealed; pintent pts. show average (within 0, 56%) of 4 namples.	Rolled: temper T.8.	

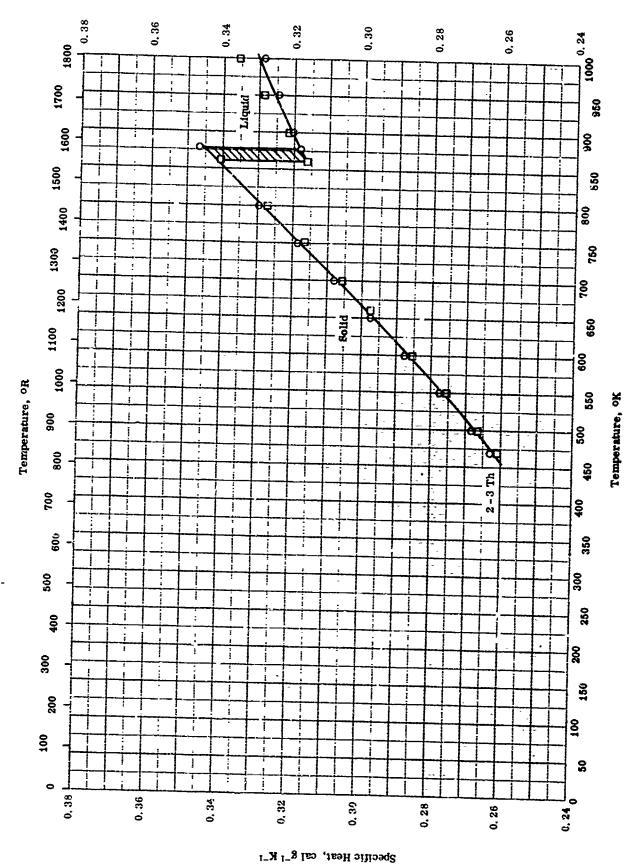


rlecthical, hembrivity -- machebium + thorium + Ex₁ (alloy 112-92xa)

ELECTRICAL RESISTIVITY -- MAGNESIUM + THORIUM + Σx_1 (Alloy + Z-32XA)

REFERENCE INFORMATION

Remarks	As cast; plotted points show average (within 1%) of 2 samples.	Cast and aged, plotted points show average (within 1%) of 2 samples.	Cast; temper T5 aged.	
Sample Specifications	Alloy HZ-32XA; 3.04 Th, 2.11 Zn, 0.77 Zr, 0.049 Mn, 0.03 >Al, 0.01 > each Ca, Sl, Su, 0.005 > Cu, 0.002 > Fe, and 0.001 > each Ni, Pb.	Same as above.	Magnesium Alloy HZ32A; 94.2 Mg, 3.0 Th, 2.1 Zn, and 0.7 Zr. Cast; temper T5 aged.	
Rept. Error%				
Temp. Range ^O K	297-540	297-544	293-353	
Ref.	56-20	56-20	57-18	
Sym	0	D	٥	



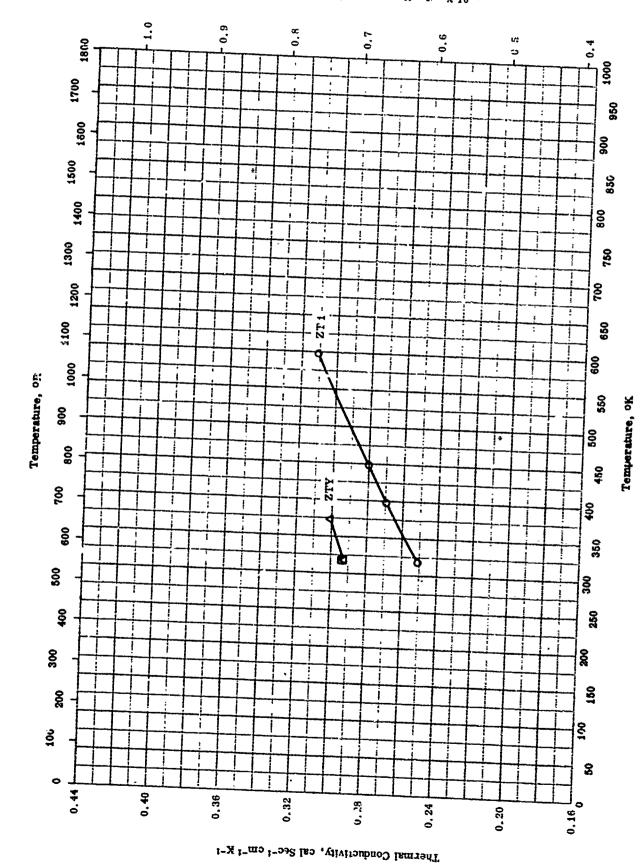
SPECIFIC HEAT -- MAGNESIUM + THORIUM + ΣX_j

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SPECIFIC HEAT -- MAGNESIUM + THORIUM + EXI

REFERENCE IN ORMATION

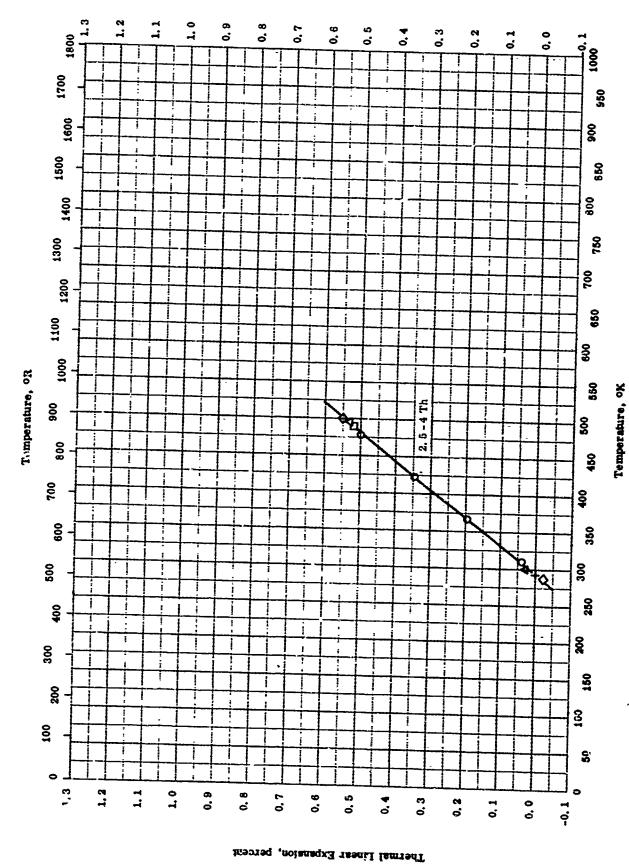
Remarks								 -							
Sample Specifications	Mg alloy HM21XA; 2, 0 Th and 0, 5 Mn			Mg alloy HK31A; 96.3 Mg, 3.0 Th, and 0.7 Zr.											
Rept. Error%															
Temp. Range ok	470-878			470-878											
Ref.	~	also	55-17	57-18	also	55-17		 	 						
Sym	0			0			 				 		 		



THERMAL CONDUCTIVITY -. MAGNESIUM +THORIUM + Σx_j

THERMAL CONDUCTIVITY -- MAGNESIUM + THORIUM + \$\Sigma X_1\$

Remarks	Cast and heat treated 16 hrs at 315 C.	The above sample measured after heated to 380 C.	Extruded.	
Sample Specifications	ZTI; 3.0 Th, 2.3 Zn, and 0.7 Zr.	Same as above.	ZTY; 0.75 Th, 0.6 Zr, and 0.5 Zn.	
Rept. Error%				
Temp. Range ^o K		318	318-373	
Ref.	64-3	64-3	64-3	
Sym	0	0	٥	



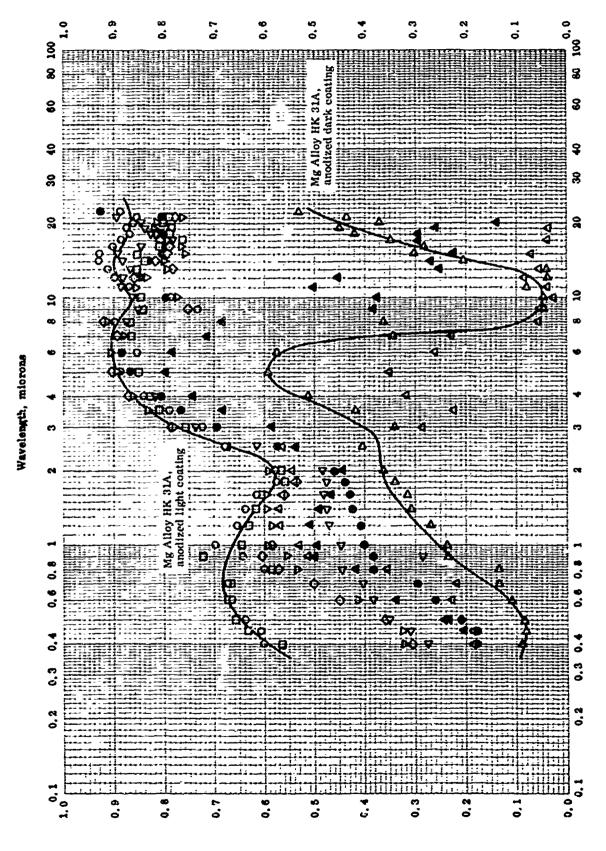
Thermal linear expansion -- magnesium + thorium + $\Sigma x_{\rm I}$

THERMAL LINEAR EXPANSION -- MAGNESIUM + THORIUM + ΣX_j

Remarks	Cast; solution heat-treated and aged; expansion coefficient for HK31 given as (14, 54 ± 0, 12) x 10"6 F"1	Cast, solution heat treated, and artificially aged.	Cast and aged.	Cast, solution heat treated, and artificially aged.
Sample Specifications	Mg Alloy HK31; nominal; 2.5-4.0 Th, 0.5-1.0 Zr, and 0.3 others.	Mg Alloy HZ32XA; 3, 04 Th, 2, 11 Zn, 0, 77 Zr, 0, 049 Mn, 0, 03> Al, 0, 01: each Ca, Sl, Sn, 0, 005> Cu, 0, 302 Fe, 0, 001> each Ni, Pb.	Same as above.	Mg Alloy HK31XA; 3.16 Th, 0.71 Zr, 0.054 Mn, 0.03> Al, 0.02> Zn, 0.01> each Ca, Si, Sn, 0.005> Cu, 0.002 Fe, and 0.001> each Mi, Pb.
Rept. Error %				
Тетр. Вапре ОК	293-478	208-488	298-488	296-488
Ref.	54-19	56-17	55-17	55-17
E O	0	0	٥	♦



Normal Spectral Reflectance



Normal Spectral Reflectance

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NORMAL SPECTRAL REFLECTANCE .- MAGNESIUM + THORIUM + Σx_1 (Mg Alloy IIK 31A)

ngsorvinonemess, pare establication and the contraction of the contrac

PROPERTIES OF MAGNESIUM + ZINC + ΣX_i

REPORTED VALUES

Melti	ng Point:	K	R
0	5.39 Zn and 0.6 misch- metals	733	1320
0	6.31 Zn and 1.16 misch- metals	753	1355
Δ	6.31 Zn and 1.70 misch- metals	768	1382
▽	6.26 Zr. and 2.23 misch- metals	778	1400
٥	6.31 Zn and 3.28 misch- metals	789	1420
Þ	6.29 Zn and 5.34 misch- metals	800	1440
♦	6.22 Zn and 7.32 misch- metals	800	1440
•	5.78 Zn and 0.74 Zr	793	1427
Heat	of Fusion:	cal g ⁻¹	Btu lb-1
3	5.78 Zn and 0.74 Zr	76 ± 4	137 ± 7

Properties of magnesium + zinc + Σx_1

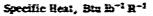
REFERENCE INFORMATION

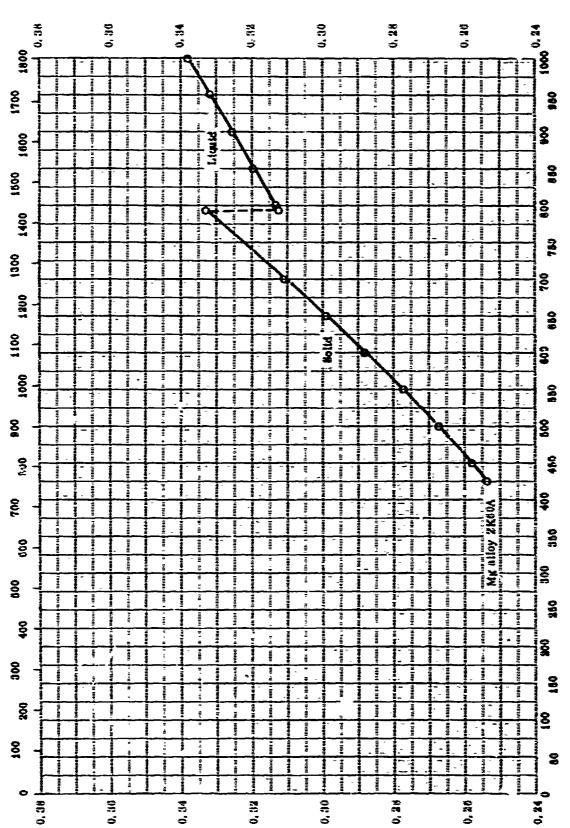
	The state of the s	M. P. metallographic liquid in sample quen	nture levels.	Same as above.	Same as above,	Manuel na abote.	Special and comment	Control of the contro		Alle by difference of Hould and solid	at M. P.			
	Sample Specifications	53.01 Mg, 6,39 Zn, and 0.40 mischmetals (approx. 50 Cc and 50 La).	92. 63 Mg. 6.31 Zh. and 1. 10 mlachmassic		_		88.37 Ms, 6.79 Zn, and 5,34 mischmetals.	86. 40 Mg, 6. 22 Zn, and 7. 32 mischmotals,	Alloy ZK 60; 93, 40 Mg, 5,78 Zn, 0,74 Zr, 0,05 Mn, and C, 03 Al.	Same us above,				
1,111,11	Error %									- -		 	 	
Tames	Hanne ok	rer	763	708	877	780	800	800	703	703				
1500	ĺ	04-10	64-10	01-1-0	84-10	64-19	01-10	54-10	87-18	87~18		 	 	
8ym	3	σ	0	4	Þ	∇	Δ	^	•			 	 	

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eprofic heat ... machreium + zing + Exi





Temporature, or

Specific Hest, cal g" K"

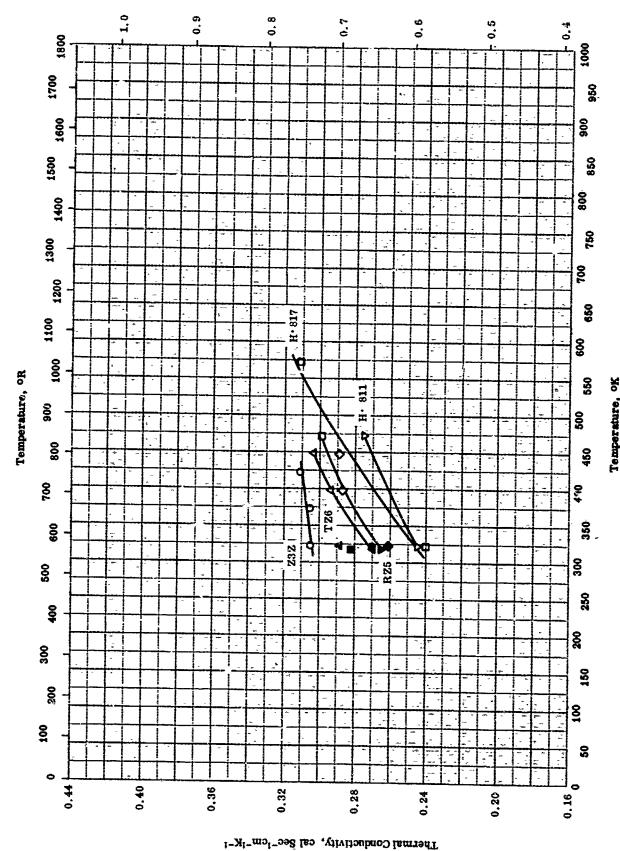
SPECIFIC HEAT -- MAGNESIUM + ZINC + ΣX_{i}

REFERENCE INFORMATION

	Remarks	
	Sample Specifications	Mg alloy ZK60A; 5.78 Zn, 0.74 Zr, 0.~5 Mn, and 0.03 Al.
-	Rept. Error%	
	Temp. Range ^O K	236-4:1.
	Ref.	also 55-17
	E G	0

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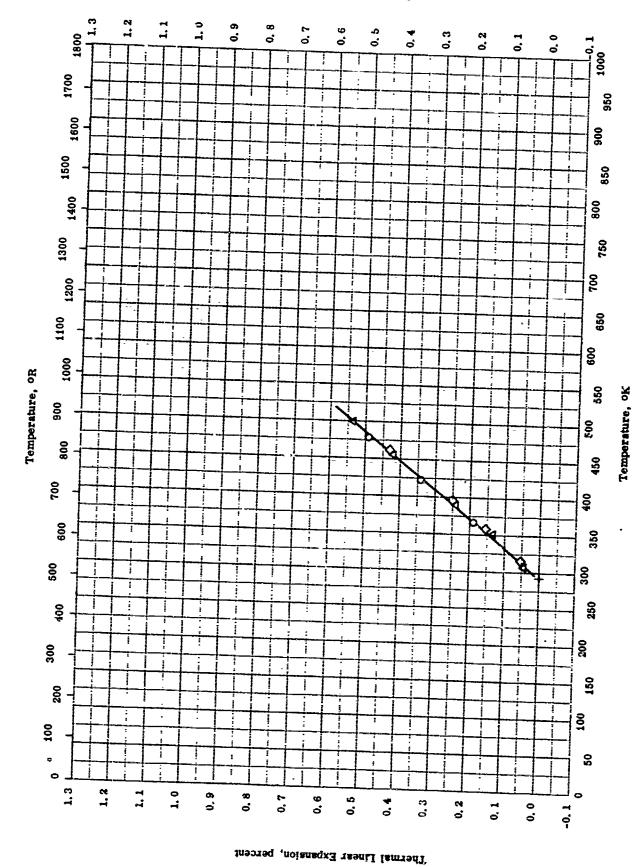
THERMAL CONDUCTIVITY -- MAGNESIUM + ZINC + ΣX_i



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THERMAL CONDUCTIVITY -- MAGNESIUM + ZINC + ΣX_1

Remarks	Sand-cast and arnealed.	hmetal. Sand-cast and annealed.	Second run of above sample,	ischmetal. Sand-cast.	Second run of above sample.	Extruded.	Cast; heat treated 2 hrs at 330 C and 16 hrs at 180 C.	Same as above except heat treated again at 205 C.	chmetal. Cast; heat treated 2 hrs at 330 C and 16 hrs at 180 C.	Second run of above sample.	
Sample Specifications	H- 807; 4. 5 Zn and 0. 7 Zr.	It 817; 4. 5 Zn, 2 Co, and 0.7 Zr; Ce in form of mischmetal.	Same as above.	H. 811; 2, 5 Zn, 2, 5 Ce, and 0, 7 Zr; Ce in form of mischmetal.	Same as above.	Z3Z; 3 Zn and 0,7 Zr.	TZ6; 5.75 Zn, 1.5 fh, and 0.7 Zr.	Same as above.	RZ5; 4. 9 Zn, 1.2 Ce, and 0.7 Zr; Ce in form of mischmetal.	Same as above.	
Rept. Error %							•••				
Temp.	323	323-573	323	323-473	323	323-423	318-448	318	318-448	318	
Ref.	64-3	04-3	64-3	64-3	64-3	64-3	6-1-3	64-3	64-3	64-3	
Sym Sol	•	0	4	D	•	0	٥		♦	>	

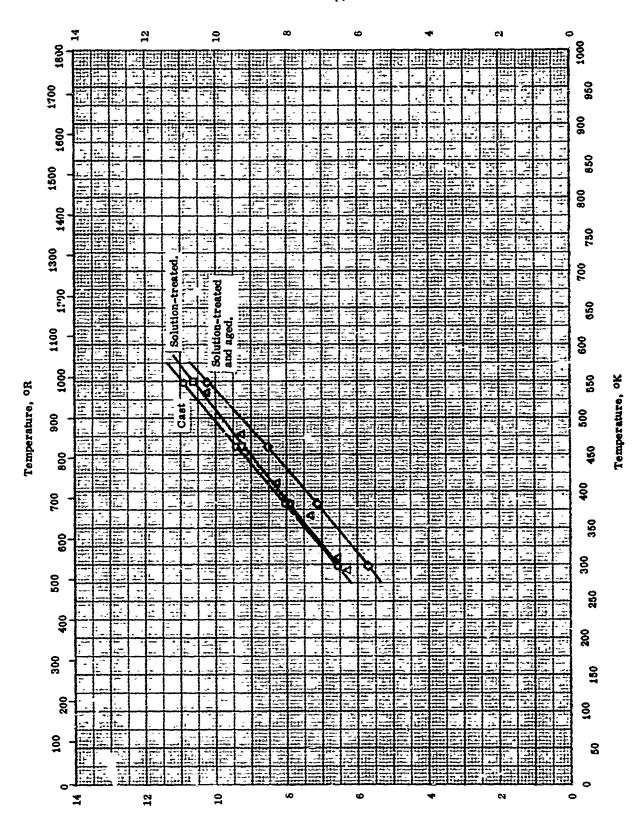


THERMAL LINEAR EXPANSION -- MAGNESIUM + ZINC + ΣX_j (4< Zn < 7; ZK60A)

THERMAL LINEAR EXPANSION -- MAGNESIUM + ZINC + Σx_1 (4 < zn < 7; ZK60A)

Remarks	Expansion coefficient for ZK60A given as $(14.72 \pm 0.08) \times 10^{-6} F^{-1}$.	Longitudinal; author gives expansion coefficient as (13, 83 ±0, 19) × 10-f F-1.	Transverse; author gives expansion coefficient as (13.84 ± 0.29) x 10 ⁻⁶ F ⁻¹ .
Sample Socifications	Mg Alloy ZK60A (ingot extruded); 5.78 Zn, 0.74 Zr, 0.048 Mn, 0.03 Al, 0.01> each Ca, Si, Sn, and 0.001> each Cu, Fe, Ni, Pb.	Mg Alloy ZK60A (pollot extruded); 5.3 Zn, 0.69 Zr, 0.046 Mn, 0.03 > Al, 0.01 > each Ca, Si, Sn, 0.006 Pb, and 0.001 each Ca, Fe, Ni.	Same as above.
Rept. Error%			
Temp. Range oK	298-489	208-489	298-489
Ref.	55-17	55-17	n6-17
E CO	0	٥	♦

ELECTRICAL RESISTIVITY -- MAGNESIUM + EX, (Alloy EK-30A)



Electrical Resistivity, ohm cm x 10¢

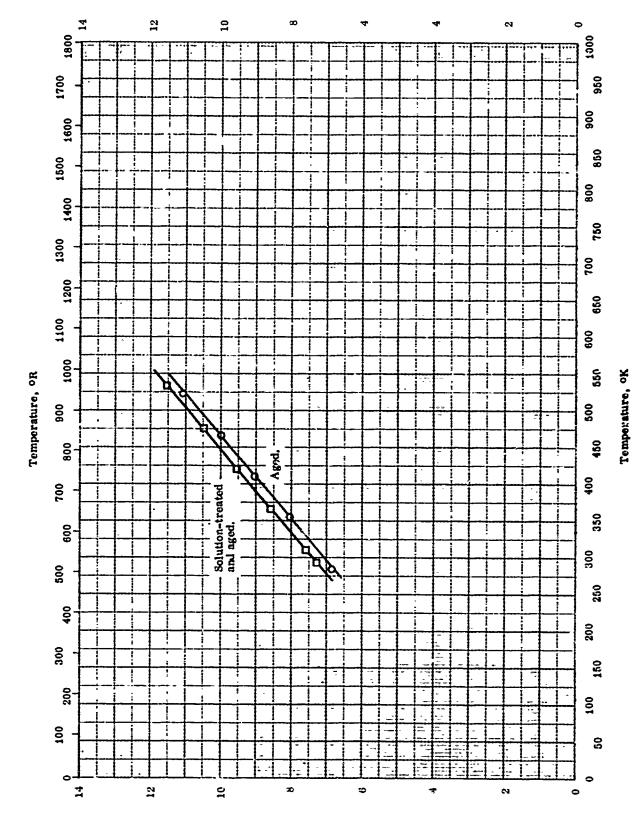
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ELECTRICAL RESISTIVITY -- MAGNESIUM + ΣX_I (Alloy EK-30A)

Remarks	As fabricated; average values for 2 samples plotted; max. dev. from mean 0. 42%.	Solution heat treated; average values for 2 samples plotted; max, dev. from mean 1,25%.	Solution heat treated then aged; average values for 2 samples plotted; max, dev. from mean 0, 6%,	Cast; temper T6, solution heat treated and aged.	
Sample Specifications	3.15 Rare Earths, 0.24 Zr, 0.066 Mn, 0.03 > Al, 0.02 > Zn, 0.01 > cach Ca, Sl, Sn, 0.002 cach Cu, Fe, and 0.001 > cach Ni, Pb.	Same as above.	Sune as above.	3.4 Rare Earths and 0.35 Zr.	
Error %					
Tomp. Range OK	299-548	299-549	208-549	293-533	
Ref.	56-20	56-20	26-20	57-18	
E 2	0	D	\lambda	٥	

ELECTRICAL RESISTIVITY -- MAGNESIUM + ΣX_1 (Alloy EK-41A)

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Electrical Resistivity, ohm cm z 10^4

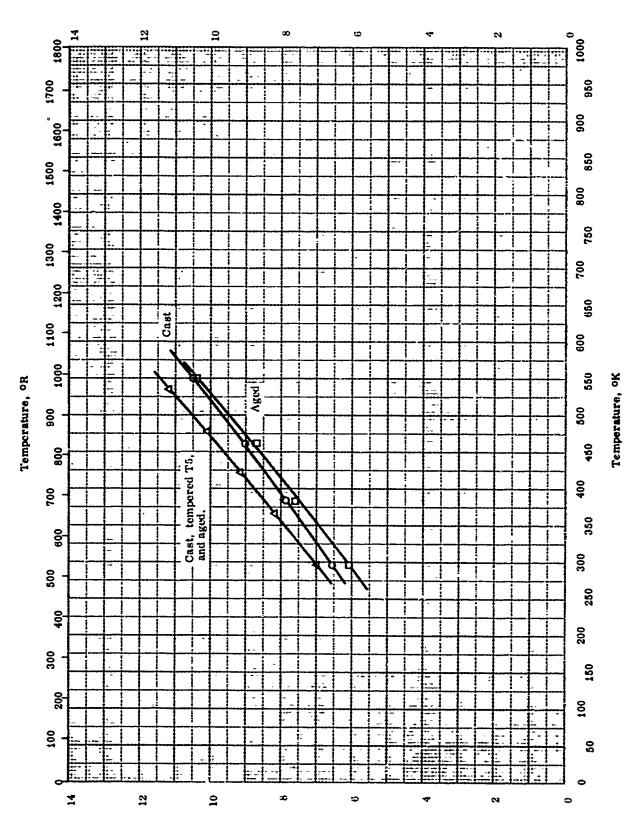
ELECTRICAL RESISTIVITY -- MAGNESIUM + Σx_i (Alloy EK-41A)

REFERENCE INFORMATION

Remarks	Cast; temper T5 - aged.	Cast; tempor T6, solution heat treated, and aged.	
Sample Specifications	4, 0 total rare earth 1 and 0, 55 Zr.	Same as above,	
Rept. Error%			
Temp. Range oK	293-533	293-533	
Rof.	67-18	57-18	
Sym	0	0	

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ELECTRICAL RESISTIVITY -- MAGNESIUM + Σx_1 (Alloy EZ-33A)

Electrical Resistivity, ohm cm x 10^4

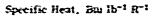
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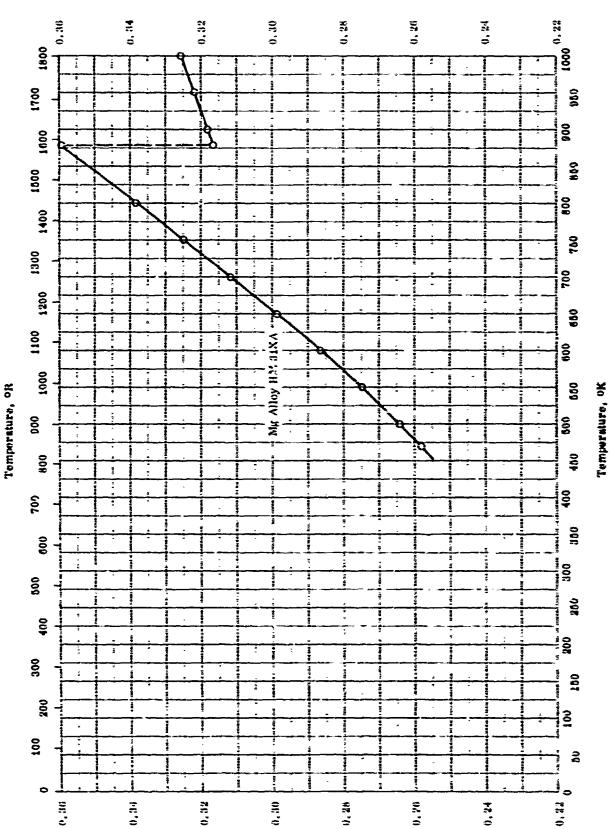
ELECTRICAL RESISTIVITY -- MAGNESIUM + Σx_1 (Alloy EZ-33A)

Remarks	As subricuted; average values for two samples plotted; max, dov, from mean 1 < 1 %,	Aged: average values for two samples plotted; max. dev. from mean 1,25%.	Cast; Tempor-T5 and aged.			
Sample Specifications	3.09 mre carth, 2.39 Zn, 0.68 Zr, 0.044 Mn, 0.03 > Al, 0.01 > Cn, 0.01 > Si, 0.01 > Sn, 0.005 Pb, 0.004 Cu, 0.001 > Fe, and 0.001 > Ni.	Same as above.	3.0 total rare earths, 2.6 Zn, and 0.65 Zr.			
Rept. Error %						
Temp. Runge 98	28×-550	298-550	2001-633			
Ref.	26-20	56-20	57.18			
System 1997	0	0	٥	 	 	



APECIFIC HEAT ... MACAESTON - EX.





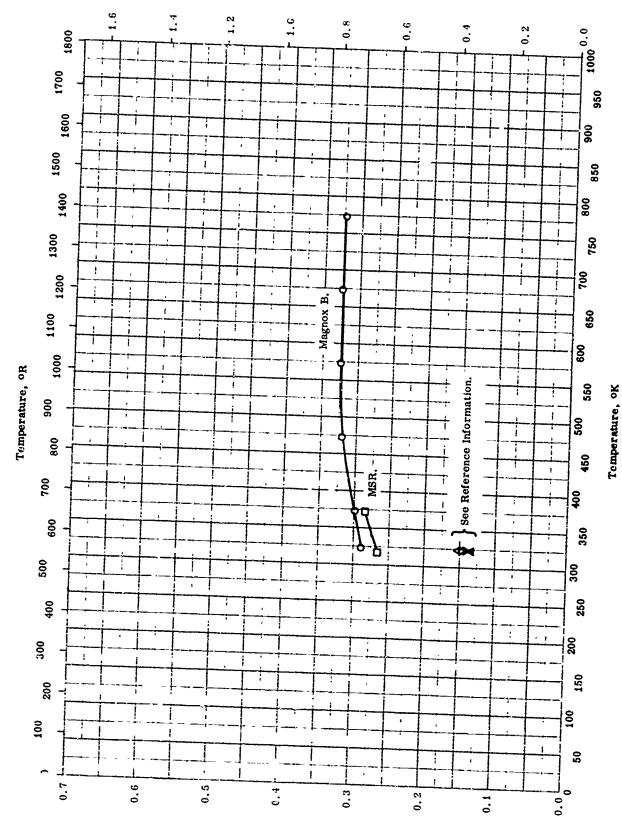
Specific Heat, cal g -: K-1

SPECIFIC HEAT -- MAGNESIUM + EXI

REFERENCE INFORMATION

Remarks	
Sample Specifications	Mg alloy HM 31XA; 2.98 total rare earth, 1.40 Mn, 0.05 Zn, and 0.03 Al.
Rept. Error %	
Temp.	470-1009
Ref.	57-18 also 55-17
Sym	0

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Thermal Conductivity, cal Sec-1 cm-1 K-1

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'ERMAL CONDUCTIVITY -- MAGNESIUM + Σ_{χ_1}

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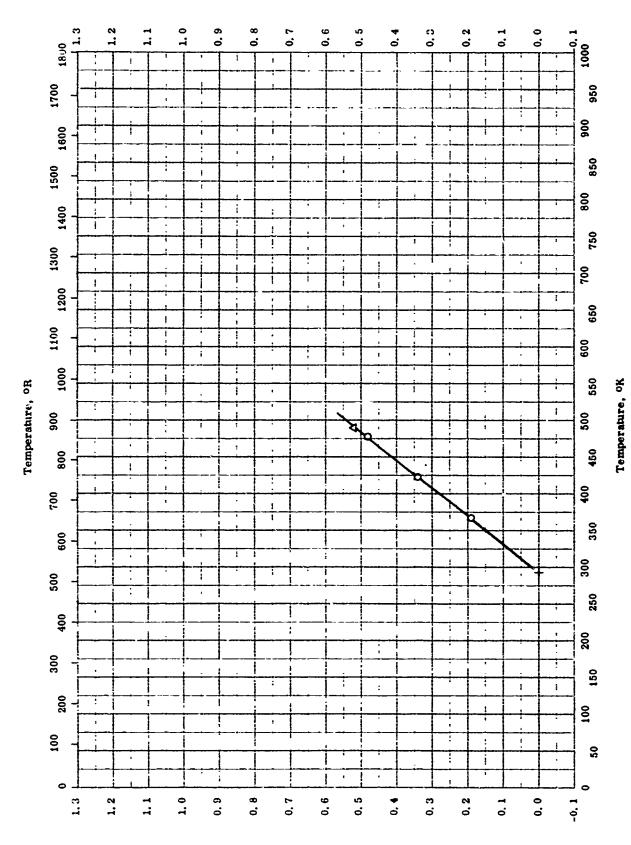
THERMAL CONDUCTIVITY -- MAGNESIUM + \(\Subseteq \)

REFERENCE INFORMATION

Remarks		Sand-cast; heated 8 hrs at 525 C, hot water quenched, and then 8 hrs at 200 C.	Sand-cast.	Solution heat-treated from the alwve sample.	Die-cast.	Solution heat-treated from the above sample.	
Sample Specifications	Magnox B; 1.0 Al and 0.002-0.003 Be.	MSR; 2.63 Ag, 1.79 Ro, and 0.4 Zn.	D. T. D. 356; 6 Sn, 3.5 Al, 0.5 > sum of Cu, Ni, Fe, and Si.	D. T. D. 360; same as above.	D. T. D. 350; same as above.	D. T. D. 360; same as above.	
Rept. Error %							
Temp, Range ^O K	323-773	318-373	323	323	323	323	
Ref.	64-3	64-3	64-3	64-3	64-3	64-3	
Sym	0	O	٥	4	D	•	

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THERMAL LINEAR EXPANSION -- MAGNESIUM + ΣX_i (2< rare earth metals < 5)



Thermal Linear Expansion, percent

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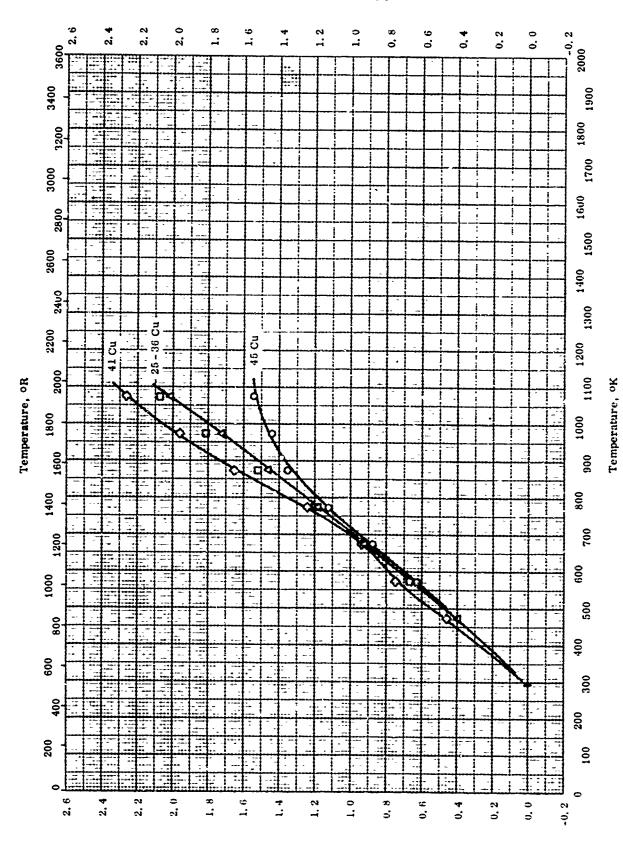
THERMAL LINEAR EXPANSION -- MAGNESIUM + ΣX_1 (2< raiv earth metals < 5)

Remarks	Cast and aged; results for the four materials are within ±0.8% of the average values plotted.	Саыt and aged.				
Sample Specifications	Mg Alloys EK30, EK32A, EK33A, and EK41; no analyses given; nominal; 2-5 rare earths, 3, 5> Zn, and 12 others.	Mg Alloy EZ33A; 3.09 rare earths, 2.39 Zn, 0.68 Zr, 0.044 each Mn, Cu, 0.03> Al, 0.01> each Ca, Si, Sn, 9.005 P., 0.001> each Fe, Ni.				
Rept. Error%						
Temp. Rarge ok	293-478	208-488				
Re4.	54-19	55-17				
Sy.m Fool	0	₫			 	

THERMAL LINEAR EXPANSION -- MANGANESE + COPPER + ΣX_1 (49< Mn < 56)

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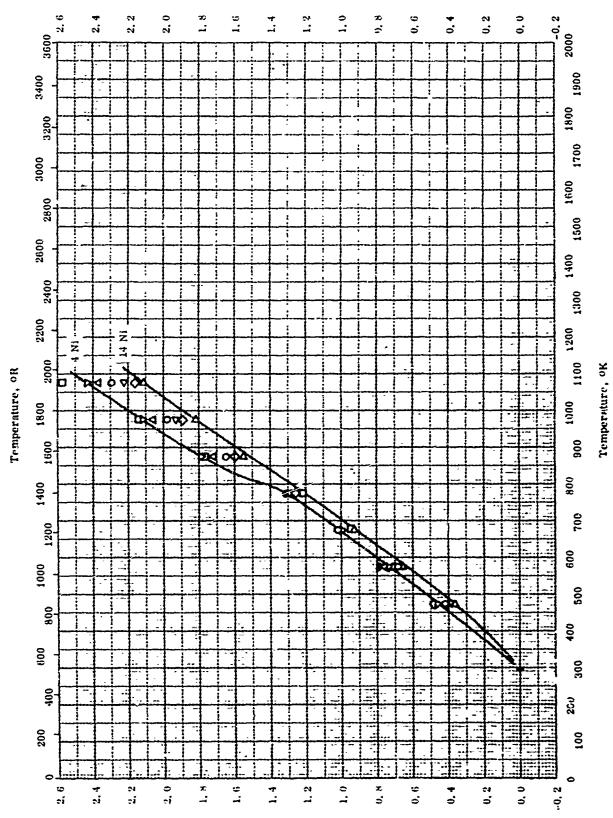


Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- MANGANESE COPPER + $\Sigma X_{\rm I}$ (49< Mn < 56)

Remarks	Quenched and homogenized,	Same as above.	Same an above.	Same as above; those six samples gave results which agree within 2%.
Sample Specifications	49.7 Mn, 45.4 Cu, and 4.9 Ni; prepared from electrolytic purity materials.	53,4 Mn, 41,0 Cu, and 5,6 Mi; same as above.	51, 5 Mn, 38, 6 Cu, and 9, 9 M; same as above,	Six samples; a) 51. 6 Mn, 35. 8 Cu, and 12. 6 Ni; b) 55. 0 Mn, 35. 4 Cu, and 9. 6 Ni; c) 54. 3 Mn, 31. 3 Cu, and 14. 4 Ni; d) 51. 3 Mn, 29. 5 Cu, and 19. 2 Ni; e) 51. 0 Mn, 25. 4 Cu, and 23. 6 Ni; f) 55. 2 Mn, 25. 0 Cu, and 19. 8 Ni.
Rept.				
Temp. Range oK	4733-1073	473-1073	473-1073	473-1073
Ret	65-38	55-38	55-38	8535
Sym	0	\$	C	٩

THERMAL LINEAR EXPANSION -- MANGANESE + COPPER + Σx_j (69< Nn < 66)



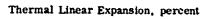
Thermai Linear Expansion, percent

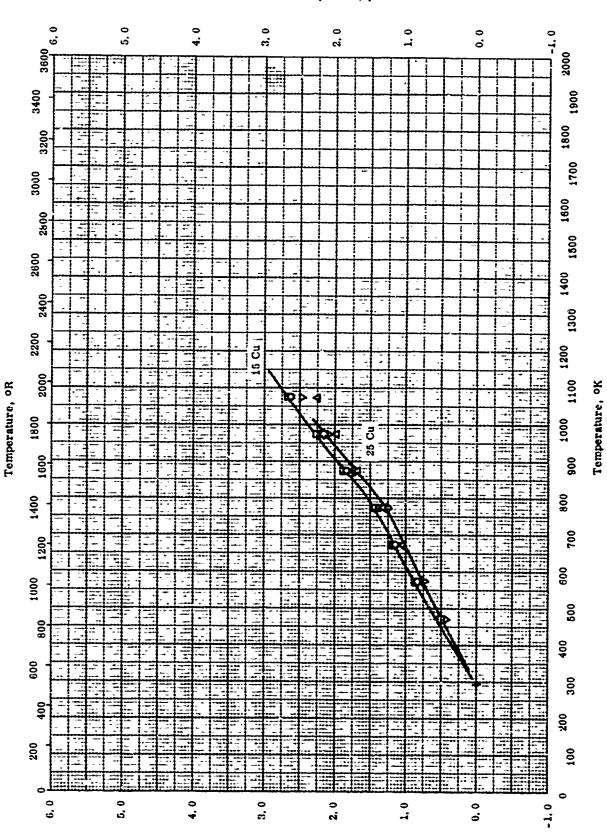
:-:: 4.

THERMAL LINEAR EXPANSION -- MANGANESE + COPPER + Σx_j (59< Mn < 66)

Remarks	Quenched and homogenized.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Sample Specifications	66.9 Mn, 19.5 Cu, and 14.6 Ni; propared from electrolytic purity raw materials.	65. 4 Mn, 29.7 Cu, and 4.9 NI; same as above.	65. 4 Mn, 24. 4 Cu, and 10.2 NI; same as whove.	59. 8 Mn, 21. 8 Cu, and 18. 4 M; same as above.	59.7 Mn, 36,5 Cu, and 3,8 M; same as above.	59.7 Mn, 33.5 Cu, and 6.8 M; same as above.	59.7 Mn, 25,9 Cu, and 14.4 Nf; same as above,	
Rept.								
Tump. Runge ok	293-1073	293-1073	293-1073	203-1073	293-1073	293-1073	203-1073	
Ref.	55-38	56-38	55-38	96-39	55-38	55-38	86-38	
E S	0	0	٥	\(\)	٥	∇	Δ	







THERMAL LIVEAR EXPANSION -- MANGANESE + COPPER + ΣX_1 (69< Mn <76)

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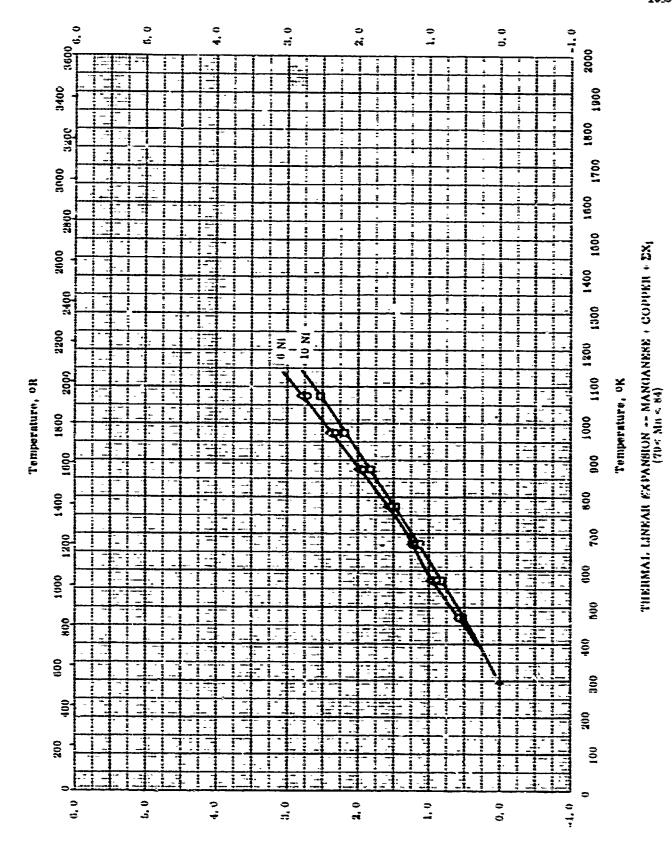
Thermal Linear Expansion, percent

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Thermal linear expansion -- manganese + copper + ΣX_j (69 < Nn < 70)

							_
Remarks	Quenched and homogenized.	Sunte as above.	Same as above.	Same as above.	Same an abeve.		
Sample Specifications	76, 6 Mn, 18, 6 Cu, and 6, 6 Mi; propared from electrolytic parity raw materials.	75.3 Mn, 14.6 Cu, and 10.1 Ni; sume as above.	70, 9 Mn, 16, 3 Cu, and 13, 8 Mi; sume ne above.	70.7 Ma, 24.6 Cu, and 9.7 NI; same as above.	69, 6 Mn, 20, 1 Cu, and 10, 3 M; same as above.		
Rept.							
Temp. Range oK	293-1073	203-1073	293-1073	293-1073	293-1073		
Ref.	55-38	55-38	56-38	86-38	80-38		
E 28	0	ם	٥	⋄	D	·	_



Resmal Linear Supersion, percent

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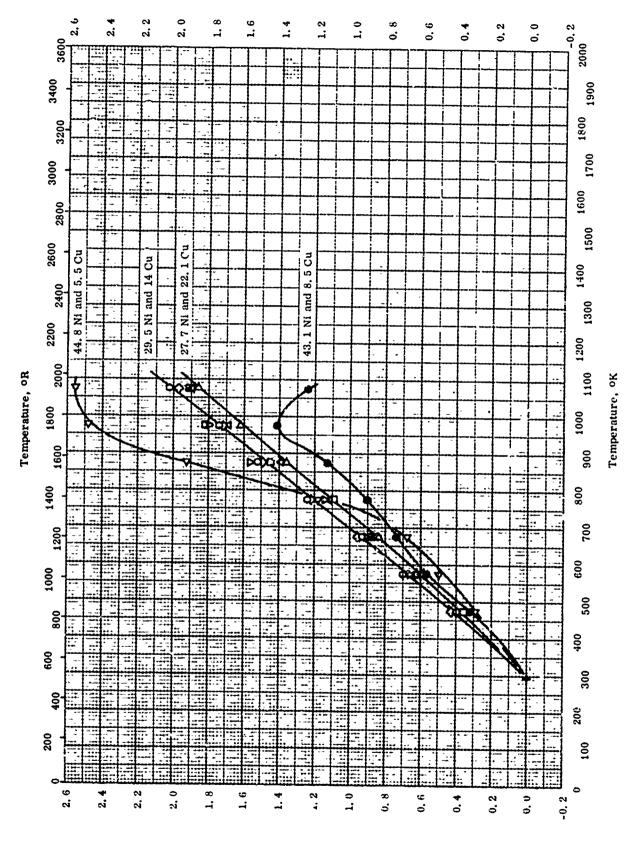
THERN'AL LINEAR EXPANSION -- MANGANESE + COPPER + ΣX_j (79< Mn < 84)

REFERENCE INFORMATION

Remarks	Quenched and homogenized.	Same as above.	Same as above.	-
Sample Specifications	79. 2 Mn, 15.0 Cu, and 5.8 Ni; prepared from electrolytic purity raw materials.	79. 8 Mn, 10. 2 Cu, and 10. 0 Ni; same as above.	83.4 Mn, 10.7 Ju, and 5.9 Ni; same as above.	
Rept. Error %				
Temp. Range ^o K		473-1073	473-1073	
Ref.	55-38	55-38	55-38	
Svm	0	C)	٥	

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THERMAL LINEAR EXPANSION -- MANGANESE + NICKEL + ΣX_1 (48 < Mn < 57)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- MANGANESE + NICKEL + ΣX_j (48< Mn < 57)

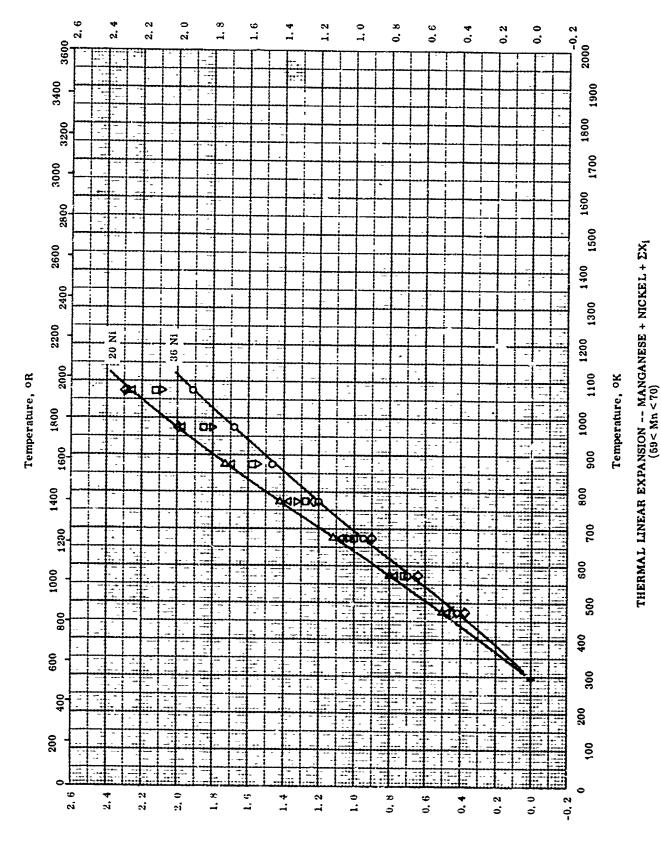
REFERENCE INFORMATION

bol Meri Range ok Error %	65-38 293-1073	55-38 293-1073	55-38 293-1073	55-38 293-1073	55-38 293-1073	55-38 293-1073	65-38 293-1073	55-38 293-1073		~~~		 	
ı	393-1073	293-1073	293-1073	293-1073	293-1073	293-10	293-10	293-1			 		
Error %						2	73	073					
Sample Specifications	56.5 Mn, 29.5 Ni, and 14 Cu; prepared from electrolytic purity raw materials.	55.0 Mn, 39.5 N., and 5.5 Cu; same as above.	54. 5 Mn, 35. v Ni, and 10, 5 Cu; same as above.	54.2 Mn, 27.7 Ni, and 21.1 Cu; same as above.	51, 9 Mn, 35, 7 NI, and 12, 4 Cu; same as alcove.	51. 1 Mn, 27.7 Ni, and 22, 1 Cu; same as above.	40, 7 Mn, 44, 8 Ni, and 5, 5 Cu; same ar above.	48. 4 Mn. 43. 1 Ni, and 8. 5 Cu; same as above.					
Remarks	Quenched and homogenized.	Same as above.	Same as above.	Sume as above.	Same as above.	Same as above.	Same as above.	Same as above.					

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Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- MANGANESE + NICKEL + $\Sigma X_{\rm I}$ (59< Mn < 70)

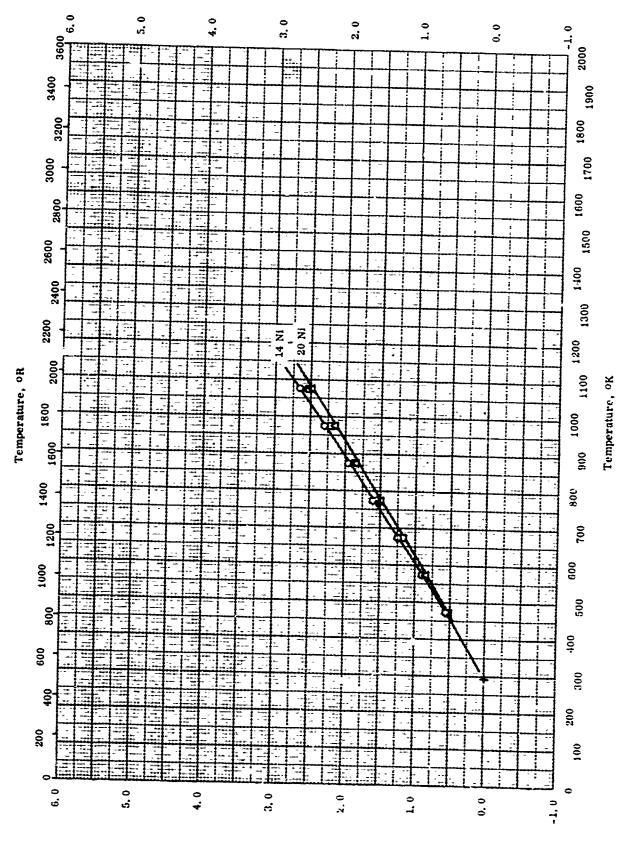
REFERENCE INFORMATION

Range OK Error%		473-1073	473-1073	473-1073	473-1073	473-1073			
Error %									
Sample Specifications	59. 6 Mn, 36.2 Ni, and 4.2 Cu; propared from electrolytic purity raw materials.	69.3 Mn, 30.3 Nl, and 10.4 Cu; also 60.0 Mn, 24.4 Nl, and 15.6 Cu; same as above.	64. 4 Mn, 24. 7 NI, and 10. 9 Cu; same as above.	64.6 Mn, 20.4 Ni, and 15 Cu; same as above.	64. 8 Mn, 30. 0 Ni, and 5. 2 Cu; same as above.	69.5 Mn, 26.5 Nl, and 10 Cu; also 69.6 Mn, 24.6 Nl, and 5.8 Cu; sa ne as above.			
Remarks	Quenched and homogenized.	Same as above; results agree within 2%.	Same as above; quenched and homogenized.	Same as above.	Same as above.	Same as above; results agree within 2%,			

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THERMAL LINEAR EXPANSION -- MANGANESE + NICKEL + Σx_1 (75: Mn < 80)



Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION --- MANGANESE + NICKEL + ΣX_j (75< Mn < 80)

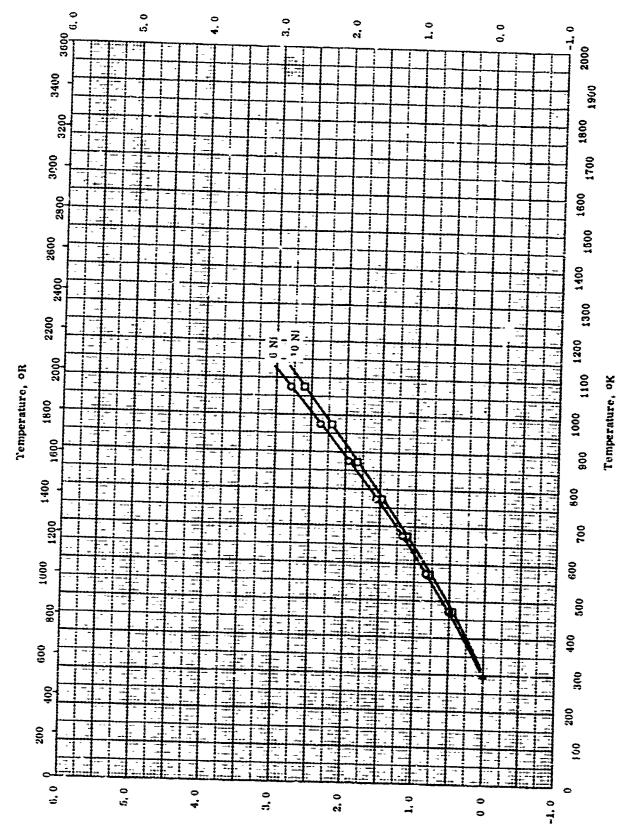
REFERENCE INFORMATION

Remarks	Quenched and homogenized.	Sume as above.	Same us above.			
Sample Specifications	79.5 Mn, 14.3 Nl, and 6.2 Cu; prepared from electrolytic purity raw materials.	75.2 Mn, 15.3 NI, and 9.5 Cu; same as above.	75. 1 Mn, 20. 1 Ml, and 4. 8 Cu; same as above.			
Rept. Error%						
Temp. Range ok	203-1073	293-1073	203-1073			
Ref.	55-38	55-38	55-38		 ,-	
<u>58</u>	0	ם	4	 	 	

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THERMAL LINEAR EXPANSION -- MANGANESE + NICKEL + Σx_1 (84 < Mn < 89)



Thermal Linear Exparaion, percent

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THERMAL LINEAR EXPANSION -- MANGANESE + HICKEL + $2X_1$ (84< Mn < 80)

REFERENCE INFORMATION

			_							
Rema '(8	Quenched and homogentzed.	Same as above.	,							
Sample Specifications	88, I Mn, 6, 6 Ni, and 6, 9 Cu; prepared vrom electrolytic purity ruw materials.	44, 6 Mn, 10, 2 Ml, and 6, 3 Cu; name as above.								
Rept. Error%			· · · · · · · · · · · · · · · · · · ·	 	 			 	-	
Temp.	299-1073	203-1073					`			
16-1.	86-39	96-30								
HON Section	0	0		 	 	 		 		

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PROPERTIES OF MOLYBDENUM \div NICKEL $\div \Sigma x_i$

REPORTED VALUES

Density: g cm⁻³ lb ft⁻³
O 31 Ni and 15 Cu 9.06 566

<u>.</u>

Remarks	
Sample Specifications	64 Mo, 31 M, and 15 Cu.
Rapt. Error%	
Temp.	208
Rof.	8 F = 99
	0

PROPERTIES OF MOLYBDENIUM - NOBIUM - EX

REPORTED VALUES

Dens	in:	g cm ^{-;}	ib fi ⁻¹		
0	10 Nb aud 10 Ti	9.43	523		
0	30 Nb 22d 16 Ti	7.62	476		
Δ	30 Nb and 30 Ti	7.0	137		
⊽	40 Nb 200 10 %;	7.35	459		
<	30 No 2=d 20 Ti	7.1	413		
Þ	40 No 200 30 Ti	6.80	423		
^	26 M 3 26 Ti	e 27	1:1		

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PROPERTIES OF MOLYBDENUM + NIOBIUM + ΣX_1

Renarks	Pressed at 4 ton cm. from powders, vacuum sintered 5 hrs each at 400C, 500C,800C, and 25 hrs at 1000 C and 12 hrs at 1700-1800 C; density from X-ray lattice dimensions; value 5-7% lower than theoretical value.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Sample Specifications	80 Mo, 10 No, and 10 Ti; prepared from 99.9 pure Mo, 98.9 pure Nb, and 99.5 pure Ti.	60 Mo, 30 Mb. and 10 Ti; same as above.	60 Mo, 20 Nb, and 20 Ti; same s above.	50 Mo, 40 Nb, and 10 Ti; same as above.	50 Mo 30 Nb, and 20 Ti; same as above.	40 Mo, 40 Nb, and 20 Ti; same as above.	40 Mo, 30 Nb, and 30 Ti, same as above.	
Rept.								
Temp. Runge ^O K	208	25.9	298	298	298	298	298	
Ref.	58-22	58-22	58-22	58-22	58-22	58-23	58-22	
Sym hoi	0	0	4	Þ	▽	Δ	♦	

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properties of molybdenum + titanium + ΣX_i

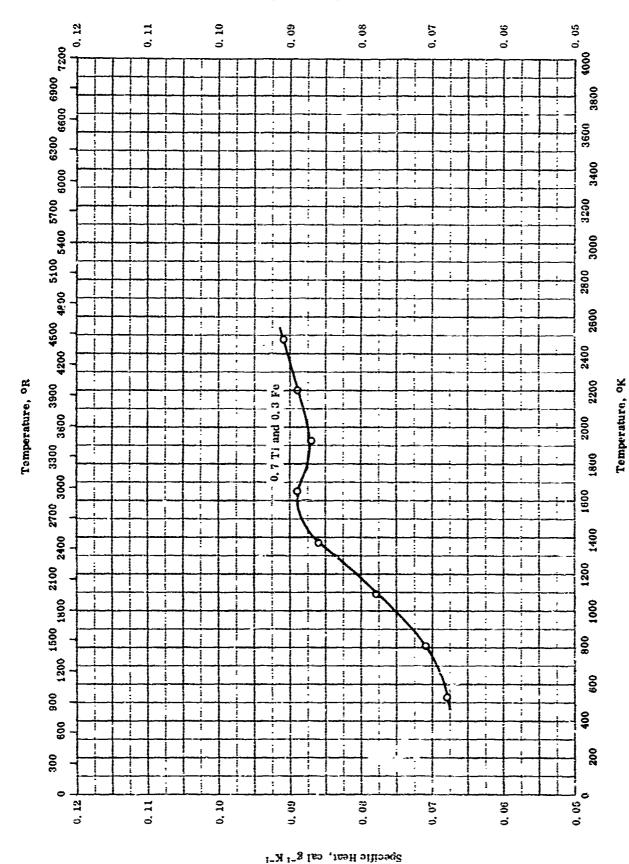
REPORTED VALUES

Dens	sity:	g cm ⁻³	lb ft ³
0	10 Ti and 10 Nb	8.45	528
	20 Ti and 10 Nb	7.55	471
Δ	30 Ti and 10 Nb	6.68	417
∇	20 Ti and 20 Nb	7.00	437
•	40 Ti and 10 Nb	6.32	395
	30 Ti and 20 Nb	6.8	425
A	40 Ti and 20 Nb	6.15	384
7	30 Ti and 30 Nb	5.63	411

Properties of molybdenum +titanium + Σx_i

REFERENCE INFORMATION

Remarks	Pressed at 4 ton cm ⁻² from powder; vacuum sintered 5 hrs each at 400 C, 600 C, 800 C, 25 hrs at 1000 C, and 12 hrs at 1800 C; density from X-ray lattice dimension; value 5-7 % lower than theoretical values.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Sample Specifications	80 Mo, 10 Ti, and 10 Nt; prepared from 99.9 Mo, 99.5 Ti, and 98.9 Nb.	70 Mo, 20 II, and 10 Nb; same as above.	60 Mo, 30 Tl, and 10 Nb; same as above.	60 Mo, 29 Ti, and 20 Nb; same as above.	50 Mo, 40 Tl, and 10 Nb; same as above.	50 Mo, 30 Ti, and 20 Mb; same as above.	40 Mo, 40 Ti, and 20 Nb; same as above.	40 Mo, 30 Ti, and 30 Nb; same as above.	
Rept.									
Temp.	25 20 20 20 20 20 20 20 20 20 20 20 20 20	298	298	208	298	298	298	298	
Ref.	58-22	58-22	58-22	58-22	58-22	58-22	58-22	58-22	
Sym Foot	0	0	٥	D	•	•	4	>	



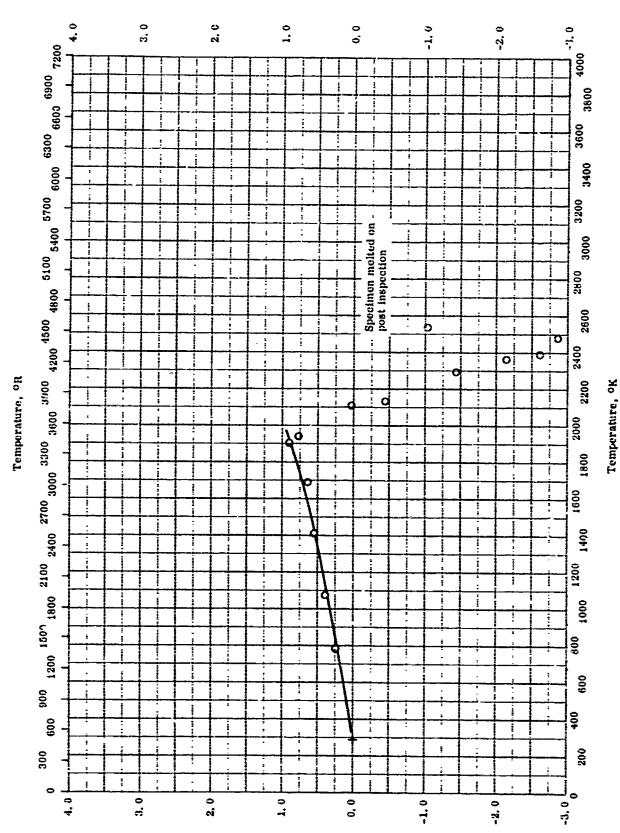
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SPECIFIC HEAT -- MOLYBDENUM + TITANIUM + DX

Rederks	Crushed in hardened steel mortor to pass 100-mesh sereen; hot pressed.
Sample Specifications	Before test: 98.6 Mo, 0.7 Ti, 0.3 Fe, 0.2 Ai, 0.2 Ni, 0.1 Si; density 585 lb ft ⁻³ ; after exposure: 98.3 Mo, 0.2 C; density 565 lb ft ⁻³ .
Rept. Error %	o ပ် န
Temp.	533 - 2478
Ref.	62-4
Sym	o



THERMAL LINEAR EXPANSION -- MOLYBDENUM + TITANIUM + EX

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Thermal Linear Expansion, percent

Thermal linear expansion -- molybdenum + $\text{titanium} + \text{DX}_{j}$

Remarks	Hot pressed; measured in helium; specimen malted on post inspection.
Sunple Specifications	General As Mo. 0.77 spectrogr exposure: after expo
Rept.	s.
Temp. Bange OK	
Ref.	62-4
Sem Tool	O

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PROPERTIES OF MOLYBDENUM + ΣX_{i}

REPORTED VALUES

Dens	ity:	g cm ⁻³	ib ft
Δ	99 Mo	6.96	434
\Q	99 Mo	8.8	513
▽	99 Mo	10.2	637

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PROPERTIES OF MOLYBDENUM + EX

REFERENCE INFORMATION

Roy Ref. Structure St	,				 	 	
Hef. Tomp, Epror 55 No. 13 208 00 Mo. 60-13 208 00 Mo. 60-13 208 00 Mo.	Remarks	Pressed f. r 270 mash powder at \$160c psi.	Present from -270 mesh powder at 81500 psf and fired 2 min at 2200 C.	Density duta probably from X-ray measurement.			
10-13 208 50-13 208 50-13 208			99 Mo.	99 Mo.			
Ref. 50-13 50-13 50-13	Rept.						
70-13 50-13 60-13	Tomp. Range ok		208	808			
	Ref.	NO-13	50-13	60-13			
		4	\lambda	٥	_		

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Properties of Neptunium + Calcium + ΣX_i

REPORTED VALUES

Dens	itv:	g cm ⁻³	lb ft ⁻³
0	0.34 Ca and 0.22 U	20.2	1260
\Diamond	0,34 Ca and 0.22 U	20.2	1260
77	0.34 Ca and 0.22 U	20,45	1277

PROPERTIES OF NEPTUNIUM + CALCIUM + EX

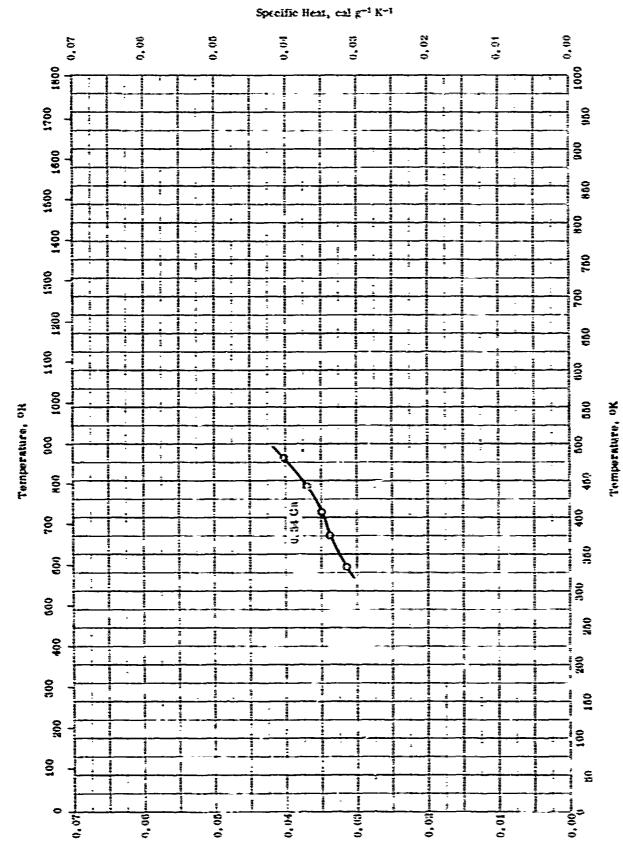
REFERENCE INCORNATION

Нетак			Density by x-ray measurement.				
Sample Specifications		Same as above except with addition traces of F and O,	Same an above.				
Rept.							
Teap. Eange ok	202	203	203				
Ref.	67-41	8743	57-43				
log Log	0	\$	Þ	<u> </u>		 	

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SPECIFIC HEAT ** NEPTONIUM *CALCIUM *EX

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SPECIFIC HEAT -- NEPTONIUM + CALCIUM + EX

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Remarks	
Sample Specifications	99, 4 Np, 0, 34 Ca, and 0, 22 U.
Rept. Error %	0 75 8
Temp. Range ok	333-480
Ref.	88-19
Sym Som	0

PROPERTIES OF NEODYMIUM + MAGNESIUM $\div \Sigma X_i$

REPORTED VALUES

Density: g cm⁻³ lb ft⁻³
O 1.0 Mg and 0.5 Ca 6.999 436.9

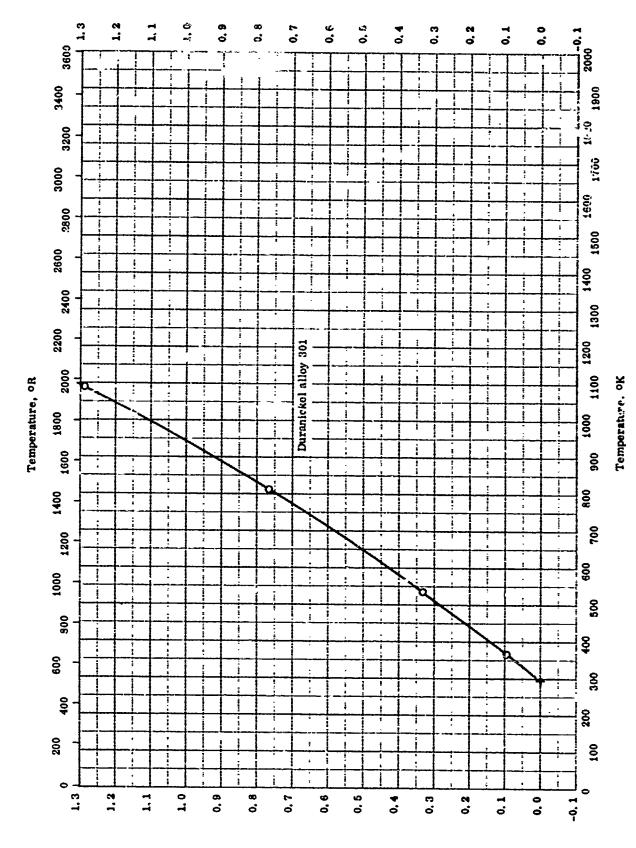
Melting Point:

☐ 1.0 Mg and 0.5 Cs 1023 ± 10 1968 ± 18

properties of neodymium + magnesium + Σx_1

REFERENCE INFORMATION

Remarks								
Sample Specifications	1.0 Mg and 0.5 Ca.	Some as above.						
Rept. Error %								
Temp. Ranze oK	298	1083-1103			 	 		
Ref.	53-20	53-20				 		
Soi B	0	0	 	 	 	 		



THERMAL LINEAR EXPANSION -- NICKEL + ALUMINUM + EX

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Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- NICKEL + ALUMINUM + EX

Remarks	
Sample Specifications	Duranickel alloy 301; formerly Duranickel alloy from International Mickol Co.; nominal; 94.0 Ni, 4.50 Al, 0.55 Si, 0.50 Ti, 0.25 Mn. 0.15 C, 0.15 Fo, 0.05 Cu and 0.005 Si density 0.298 ib in. 3 and melting point 2550 - 2620 F.
Ropt. Error %	
Temp, Range ok	294-1089
Ref.	4-29
E TOO	0

PROPERTIES OF NICKEL+CHROMJUM+ ΣX_i

REPORTED VALUES

De. 3	ity **	g cm-;	lt ft ⁻³
0	Inconel	9.47*	529 [*]
0	Inconel X	8.254*	515.3 [*]
▽	inconel X	8.25	515
Δ	Inconel	8.47	529
٥	Inconel	8.40	524
D	Inconel X	8.20	512
♦	Hastelloy X	8.15	509
	Evanohm	8.1	510
•	19 Cr and 0.64 Si	8.35	521
▼	Hastelloy C	8.921	556.9
4	17 Cr, 17 Mo, and 6 Fe	8.9	555,4
Melt	ing Point	к	R
4	Inconel X	1693 ± 15 [‡]	3030 ± 30*
•	Inconel X	1555	2810
•			
•	30 Cr and 30 Mo	1553	2796
•		1553 1633	2796 2940
•	40 Cr and 10 Mo		
0	40 Cr and 10 Mo	1633	2940
0	40 Cr and 10 Mo 22.5 each Cr and Mo 36 Cr and 9 Mo	1633 1563	2940 2814
□	40 Cr and 10 Mo 22.5 each Cr and Mo 36 Cr and 9 Mo	1633 1563 1588	2940 2814 2859
₩	40 Cr and 10 Mo 22.5 each Cr and Mo 36 Cr and 9 Mo 28 Cr and 7 Mo	1633 1563 1588 1673	2940 2814 2859 3012

^{*} Most probable value for alloys of this composition.

^{**}See the following figure for additional densities as a function of temperature.

Properties of nickel + chromium + Σx_i

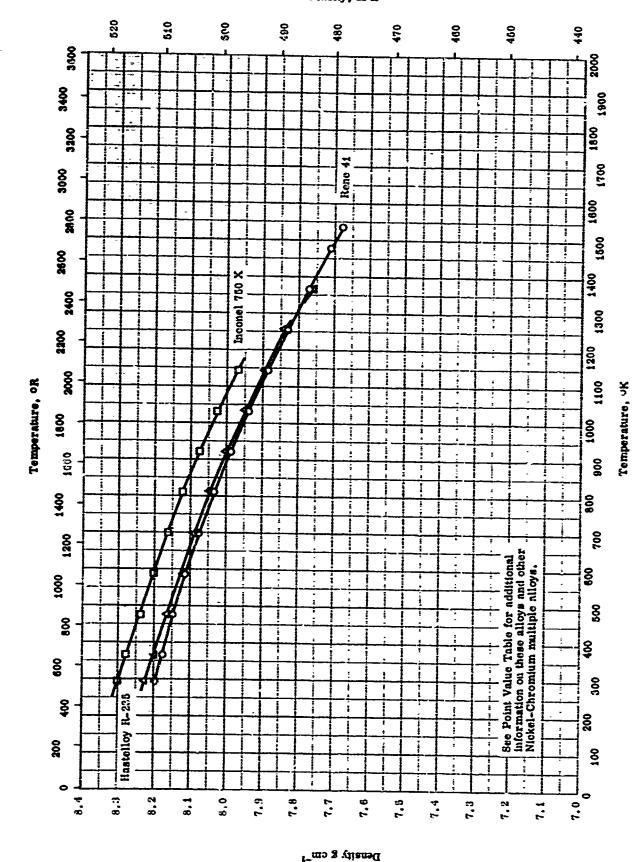
Sym	•	4	>	▼	<u> </u>	•	•	8	4	>	V	6	•	
Ref.	48-3	58-13	57-32	49-0	65-31	65-28	55-28	55-28	55-28	55-28	60-15	63-17	63-17	
Temp. Runge ok	208	208	807	1617-1700	1561	1823	1633	1563	1588	1673	208	1698	1698	
Kept. Error%		·-·												
Sample Specifications	Evanoim; 75 Ni, 20 Cr, 2,5 Al, and 2,5 Cu.	79.52 Ni, 19.33 Cr, 0.64 Si, 0.31 C, 0.17 Fe, 6.03 Mn, and traces P.	Hastelley C; before test: 56.07 Ni, 15.83 Cr, 14.57 Mo, 4.94 Fe, 4.41 W, and 0.07 C, and after test: 56.00 Ni,15.82 Cr, 14.53 Mo, 5.04 Fe, 4.49 W, and 0.068 C.	Inconel X.	Inconel X; 73.19 Ni, 14.77 Cr, 8.60 Fe, 1.84 Ti, 0.95 each Cr and In, 0.47 Mo, 0.18 Al, and traces Cu, Ca, B, Zn.	40 Ni, 30 Cr, and 30 Mo.	50 Ni, 40 Cr, and 10 Mo.	55 Ni, 22, 5 Cr, and 22, 5 Mo.	55 Ni, 36 Cr, and 9 Mo.	65 NI, 28 Cr, and 7 Mo.	52 NI, 17 Cr, 17 Mo, 6 Fo, 4.6 W, 2.5 a Co, 1.03 Mn, 1.0 a Si, 0.4 V, and 0.15 a C.	Inconci; 80 Ni, 14 Cr, and 6 Fe.	Inconel 702; 80, 9 Ni, 14 Cr, 2.0 Fe, 2.76 Al, 0.25 Ti, und 0.11C.	(continued cuto next page)
Memarks					M.P. by visual observation during manufecture.	Same as above except of powder in graphite equiple,	Same as above.	Samo as abovo.	Same as above.	Same us above.				

PROPERTIES OF NICKEL + CHROMIUM + EX. (Continued)

REFERENCE INFORMATION

Γ	T		<u>.</u> 10					
Ushing	Annealed; density by displacement.	Doneity measured same as above,	Hot-rolled; solution heat treated 3 hrs at 2100 F, sir cooled, double aged at 1550 F for 24 hrs and 1300 F for 20 hrs and then follow by air cooling after each aging.	Hot-rolled, annealed 3 brs at 1600 F, 15 min at 1800 F and air cooled.				
Sample Succifications	Inconel; nominal com	Inconel X; nominal composition: 70 Min Ni, 14-16 Cr., 5-9 Fe. 2.2 -2.75 Ti, 0.7-1.2 Nb, 0.4-1.0 Al. and 0.3-1.0 Mn.	Inconel X; 72.94 Ni, 14.65 Cr, 6.97 Fe, 2.44 Ti, 1.01 Nb, 0.93 Ai, 6.54 Mn, 0.46 Si, 0.03 C, and 0.02 Cu.	Incord; 78.92 Ni, 14.62 Cr. 5.80 Fe, 0.23 Mn, 0.19 Si, 0.09 C, Hot-rolled, annealed 3 hrs at 1600 F, 15 min at and 0.007 S.	Inconel; 15.15 Cr. 8.24 Fe, 0.35 Ti, 0.30 Mn, 0.23 St, 0.064Cq. and 0.077 C.	Inconel X; 14.04 Cr. 7.93 Fe, 2.73 Ti, 0.67 Mn, 0.57 Nb, 2.56 Ai, 0.41 Si, and 0.064 C.	Hastelloy X; 19.79 Cr. 17,95 Fe, 7.43 Ma, 1.58 Co, 0.86 Sl, 0.81 Mn, 0.19 Tl, 0.13 W, and 0.11 C.	
Rept.	Error %							
Temp.	203	293	\$ 00 \$ 00 \$ 00 \$ 00 \$ 00 \$ 00 \$ 00 \$ 00	293	298	788	200	
Raf.	58-1	1-88-1		516	5813	58-13	58-13	
in S	8 0	0	Þ	4	▽	Δ	\lambda	

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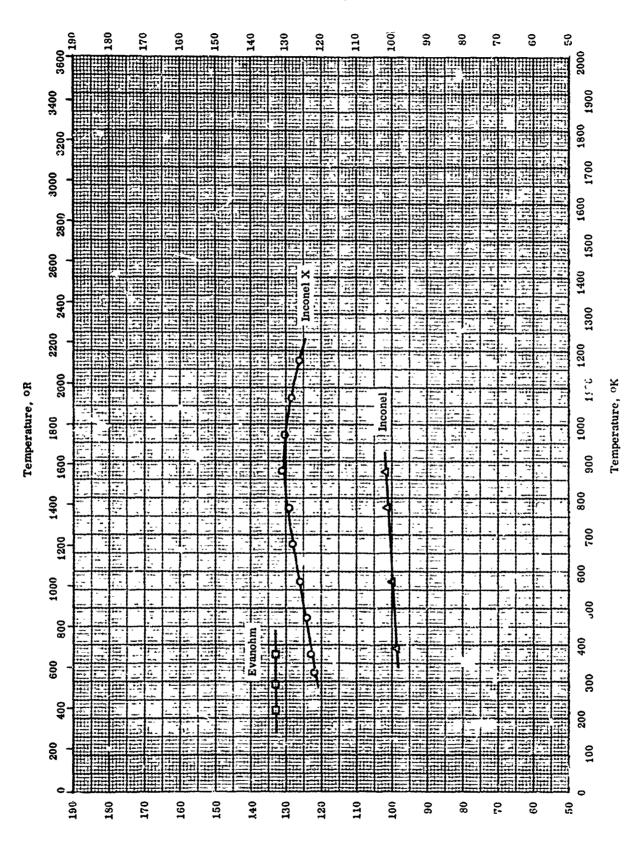
DENSITY -- NICKEL + CHROMIUM + EX

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density -- nickel + chromium + Σx_1

				 	 	
Romelis					-	
Sample Specifications	Rene 41; 19 Cr, 11 Co, 10 Mo, 3 Ti, 3 Fe, 1.6 Al, and 0.1 C.	Inconol 750 X; 70 >Ni, 14-17 Cr, 5-9 Fe, 0.4-1.0 Al, 2.25- 2.75 Ti, 0.7-1.2 Nb, 0.3 >Co, 0.5 > Si, and 0.08 >C.	Hastelloy 16-235; 15, 5 Cr., 10 Fe, 5.5 Me, 2, 5 Co. 2, 5 Ti, 2 Al., 1 Mn, 1 8!, and 0, 16 C.			
Rept.						
Temp. Range ok	204-1633	254-1146	294-1366			
Ref.	63-6	69-3	95-6			
Sym	0	0	٥	 		

ELECTRICAL RESISTIVITY -- NICKEL + CHROMIUM + ΣX_j

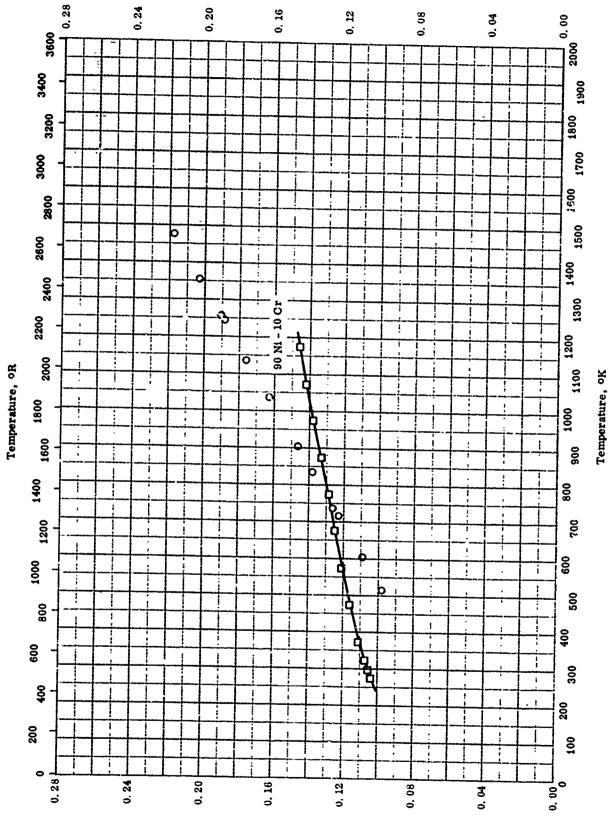


Electrical Resistivity, ohm cm x 106

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Electrical resistivity -- nickel + chromium + Σx_I

Remarks				
Sample Specifications	Inconel X; 70< Ni, 14-16 Cr, 5-9 Fe, 2.25-2.75 Ti, 0.7-1.2 Nb, 0.4-1.0 Al, 0.3-1.0 Mn, 0.50 max. Si, 0.20 Cu, 0.08 C, and 0.01 S.	Evanohm; 75 Ni, 20 Cr, 2.5 Al, and 2.5 Cu; density 506 lb ft-3.	Inconel; 79.5 Ni, 13.0 Cr, 6.5 Fe, and 0.08 C.	
Rept. Error%				
Temp. Range oK	323-1173	222-375	293-873	
Ref.	52-4	48-3	61-21	
Sym	0		٥	



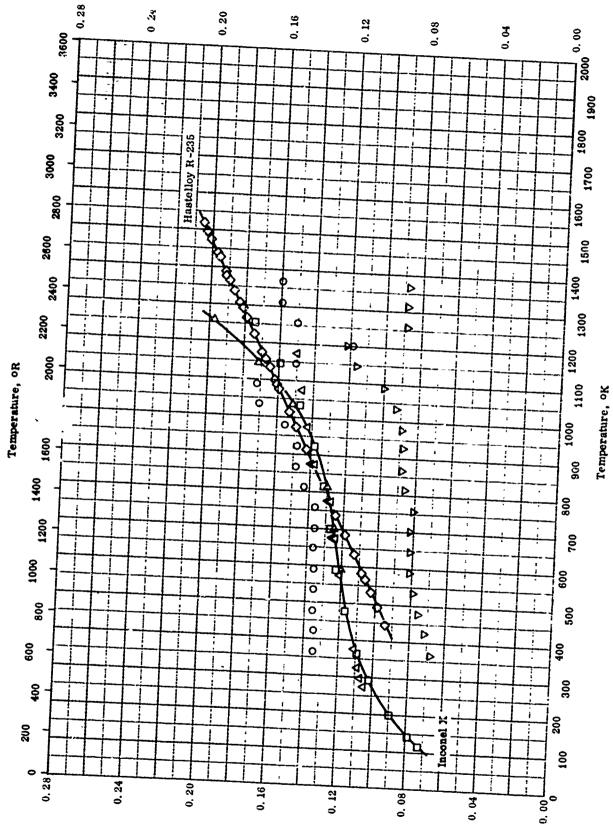
SPECIFIC HEA'S -- NICKEL + CHROMIUM + ΣX_1 (9 < Cr < 11)

Specific Heat, cal g-1 K-1

SPECIFIC HEAT -- NICKEL + CHROMIUM + Σx_1 (9 < Cr < 11)

ГП		
Remarks	Under Hellum atmosphere.	Unannealed; under Helium atmosphere.
Sample Specifications	Inco 713 C, 71.53 Ni, 11.0 Cr, 6.5 Al, 5.9 Fe, 3.5 Mo, 1.0 (Nb + Ta), 1.0 Mn, 1.0 Si, 0.25 Ti, and 0.2 C; density 576 lb ff ⁻³ .	90 Ni - 10 Cr; 89.1 Ni, 9.6 Cr, 0.63 Fe, 0.42 Si, 0.12 Zr, 0.08 Co, 0.01 Cu, and 0.01 Mn.
Rept.		0 1
Temp. Range ok	~	273-1173
Ref.	61-2	61-16
Sym	0	0

1 41 191



SPECIFIC HEAT --- NICKEL + CHROMIUM + ΣX_1 (15 \leq Cr < 16)

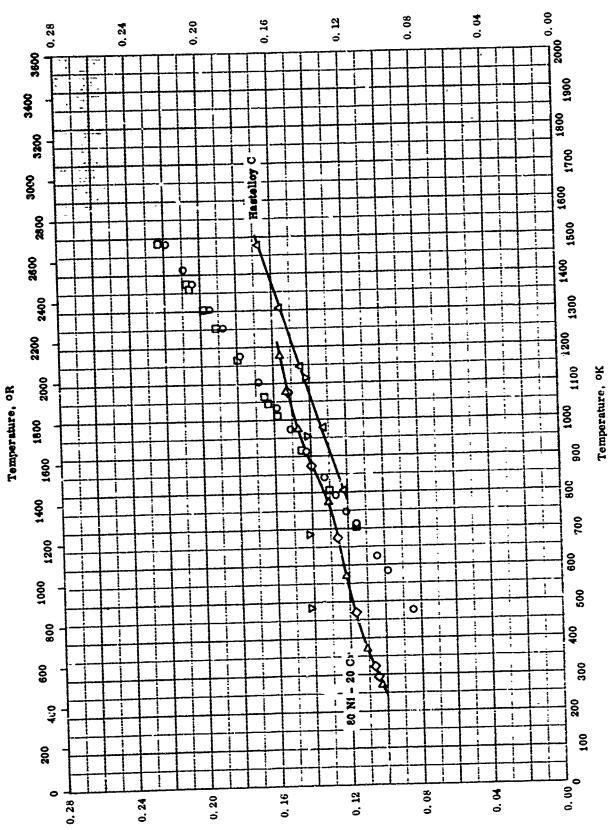
Specific Heat, cal g-1 K-1

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Specific heat ~- nickel+ chromium + Σx_1 (15 \leq Cr < 16)

Remarks	80 Mi, 15 Cr., 3.0 Al. 9.5 Tt, Heated to 1975 F for 1/2 hr and air cooled and again heated to 1400 F for 5 hrs and air cooled.	Annealed 3 hrs at 1600 F, hold for 15 min, at i800 F, and then air cooled; scaled under helium atmosphere.		Solution heat-treated 3 hrs at 2100 F, air cooled, double aged 24 hrs at 1550 F and then air cooled, and finally held 20 hrs at 1300 F and air cooled; sealed under helium atmosphere.	Heated 2 hrs at 2100 F, air cooled, heated 24 hrs at 1550 F, tir cooled, and finally heated 20 hrs at 1300 F and then air cooled.	Under helium atmosphere.
Sample Specifications	Inconel 702; nominal composition: 80 Ni, 15 Cr., 3.0 Ai, 9.5 Ti, 0.35 Fe, and 0.05 C.	Inconel; nominal composition: 78 Ni, 15 Cr. 7 Fe. 0.35 Mn, 0.2 Si, and 0.04 C; density 390 1b ft ⁻³ .	76 Ni, 15 Cr, and 9 Fe.	Inconel X; nominal composition: 73 Ni, 15 Cr, 7 Fe, 2, 5 Ti, 1, 0 Nr, 0, 9 Al. 0, 7 Mn, 0, 4 Sl, and 0, 04 C; density 380 Jr it ³ at 32 F.	Incorel X: nominal composition: 70.0 ≤Ni, 15.0 Cr, 7.0 Fe, 2.5 Ti, 0.95 Nb, 0.70 Al, 0.02 ≥ Cu, and 0.08 ≥ C.	0, 66-2, 3 Hastelloy R-235; nominal composition: 66, 85 Ni, 15, 5 Cu, 10 Fe, 5 Mo, 2, 5 Ti, and 0, 15 C.
Rept. Error%	5-10		±0.3		6-10	0, 66-2, 0
Temp. Range ^O K	366-1366	116-1255	273-1173	116-1255	366-1366	390-1514
Ref.	59-14	58-1 ulso 54-13	61-16	58-1	59-14	58-7 also 59-13
E SO	0	0	٥	Δ	Þ	♦



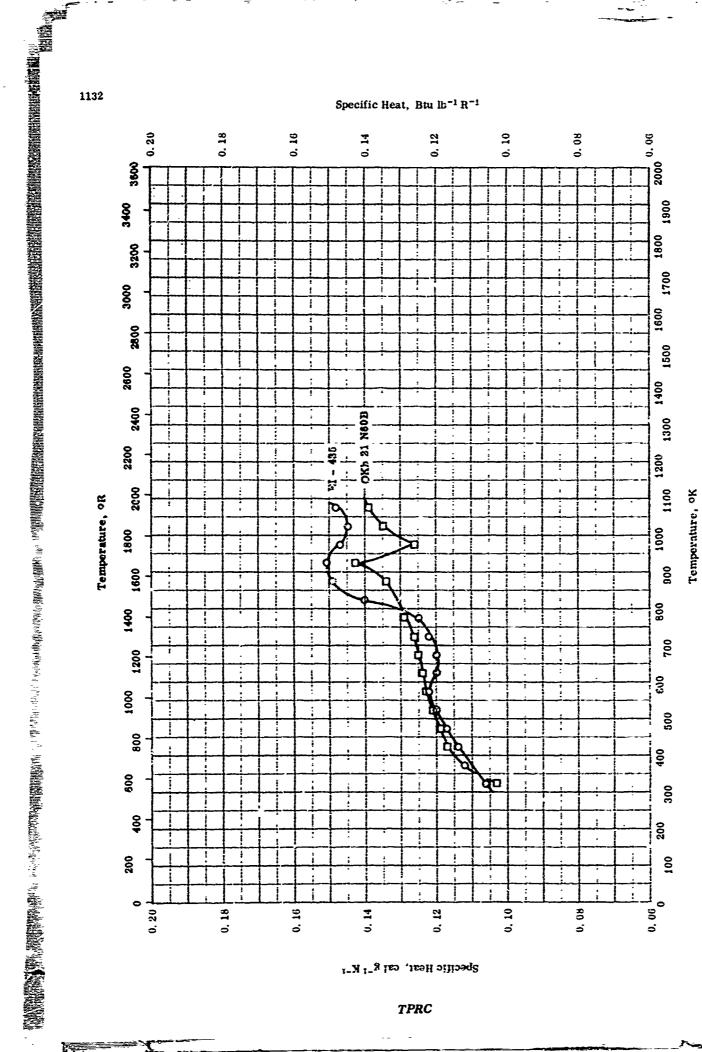
SPECIFIC HEAT -- NICKFL + CHROMIUM + ΣX_1 (18 < Cr < 20)

Specific Heat, cal g⁻¹ K⁻¹

TPRC

SPECIFIC HEAT --- NICKEL + CHROM!UM + ΣX_I (18 < Cr < 20)

						
Remarks	Solution heat treated at 1975 F and water quenched; under hollum atmosphere.	Same as above.				
Sample Specifications	Rono 41, GE-J1610; 54, 60 Ni, 18.6 Cr, 10.73 Cu, 9.63 Mo, 3.14 Ti, 1.54 Fo, 1.49 Al, 0.11 C, 0.08 Mn, 0.07 Si.	M252, GE-J1590; 57.15 Ni, 18.65 Cr, 9.98 Mo, 9.75 Cu, 2.74 Ti, 1.17 Ai, < 0.2 Fe, 0.12 C, 0.07 Mn, 0.06 Si; density 512 lb ft ⁻⁸ .	Hastelloy C; before test: 56.07 Mi, 18.83 Cr, 14.57 Mo, 4.94 Fe, 4.41 W, 0.070 C, after test: 56.00 Ni, 15.82 Cr, 14.53 Mo, 5.04 Fe, 4.49 W, 0.068 C; density 556.9 lb ft ⁻³ .	80 Ni-20 Cr; 77.4 Ni, 19.5 Cr, 1.4 Si, 0.59 Mn, 0.45 Fe, 0.04 C.	Nichroma V; 77.4 Ni. 19.6 Cx, 1.4 Si, 0.59 Mn, 0.45 Fe, 0.04 C.	Brazing compound, GEH62-V; 70.3 Ni, 19.5 Cr, 11.2 Si.
Rept. Error %	3.0	o ::		# 0°3	၁ ဂ် #	
Temp. Rango ok	479-1483	470-1483	7:0-1460	27:1-1173	27:1-1173	484-1113
Ref.	61-2	61-2	28.2	61-16	63-12 also 56-16	53-14
Sym	0	0	4	◊	Δ	Þ

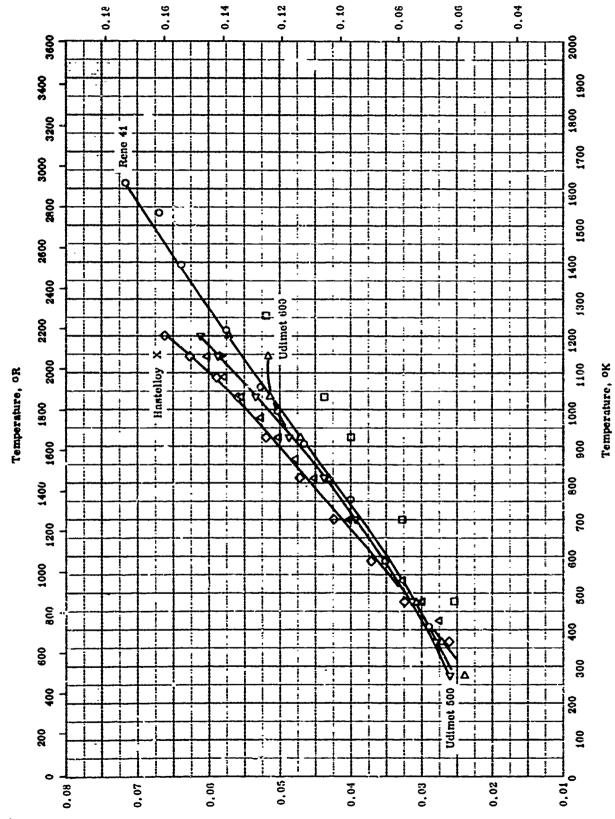


SPECIFIC HEAT --- NICKEL + CHROMIUM + ΣX_1 (Cr > 20)

Specific Heat, cal g-1 K-1

SPECIFIC HEAT -- NICKEL + CHROMIUM + Σx_j (Cr > 20)

enter programme en en en en en en en en en en en en en	Kenarks	Quenched in water from 1100 C.	Quenched in water from 1050 C and tempered 1 hr in air at 720 C.					
Constitutions		OMNZINTS ILEI-4355; 77. ZZD NI, ZL. I Cr., 0. 56 Fe, 0. 49 Me, 0. 32 SI, 0. 23 TI, 0. 06 C, 0. 006 S, 0. 006 P, and trace of Cu.	OKH20N60B; 69, 64 NI, 20, 4 Cr., 17, 7 Fe, 1, 69 Mn, 0, 58 Nb, 0, 25 Si, 0, 06 C, and 0, 004 S.					
Rept.	Error%) H	# 1.0				<u>-</u>	
1	1	6) TT-682	203-1173					
Rof	\top	21.00	63-2				 	
Svm	<u>.</u>	0	0	 	 			



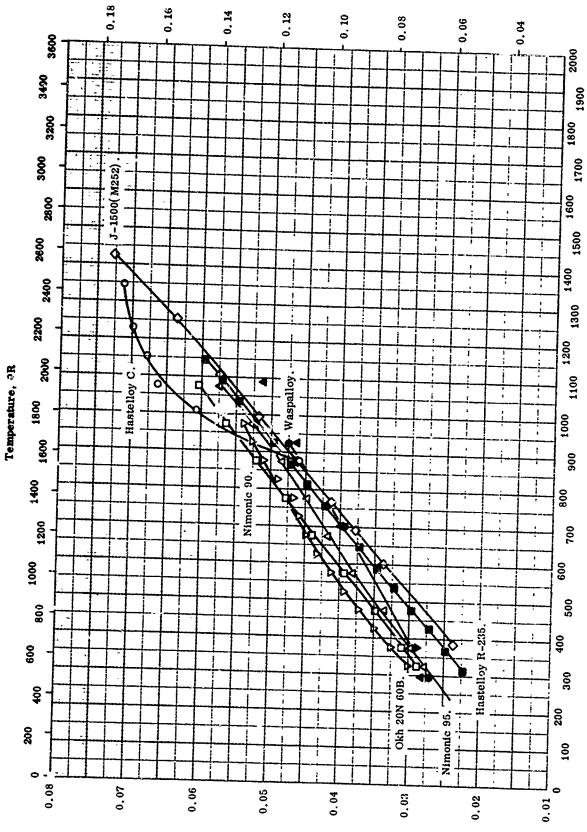
THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + ΣX_1

Thermal Conductivity, cal Sec- 1 cm $^{-1}$ K^{-1}

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THERMAL CONDUCT: "TY -- NICKEL + CHROMIUM + EXI (NI = 56)

	·							_
Remarks	Sample contained 5 one-inch dia disks.			Wrought form.				
Sample Specifications	Reno 41; 54.0 NI, 18.0 Cr, 10.73 Cu, 9.63 Mo, 3.14 TI, 1.54 Fo, 1.49 AI, 0.11 C, 0.08 Mn, and 0.07 SI,	fame as alove.	Rene 41 (J-1610); 55 Ni, 19 Cr, 11 Cc. 10 Mo, 3, 1 Ti, 1, 5 Al, and 0, 09 C; density 0, 298 lb in-3,	Udimet 600; 60.59 NI, 17.6 Cr., 16.6 Co, 4.0 Fo, 4.0 Mo, 3.0 Tl, 2.76 Al, 0.76 Mn, 0.76 Sl, 0.16 C, and 0.006 B,	ddimet 500; F? Ni, 17.5 Cr, 16.5 Co, 4.0 Fe, 4.6 Mo, 3.0 Ai, 3.0 Ti, 0.75 Mn, 0.75 Si, 0.15 C, 0.15 S, and 0.008 B; donaty 0.200 ib in-3.	Udimet 600; 60 Mi, 17. 5 Gr, 16. 5 Co, 4. 2 Al, 4. 0 Fe, 4. 0 Me, 3. 0 Tl, 114 0. 10 C; density 0. 285 lb in-1.	Hastolloy X; 48.4 NI, 22, 0 Cr, 18, 5 Fo, 5, 0 Mo, 1, 5 max Co, and 0, 6 W.	
Rept. Error%	9 V							
Temp.	406-1617	478-1266	422-1144	1144	273-1200	273-1200	306-1200	
Ref,	01-2	03-6	59-7	60-8	6-09	a-09	21- 21-	
E 20	0	0	٥	>	▽	Δ	♦	_



THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + Σx_1 (55 < Ni < 60)

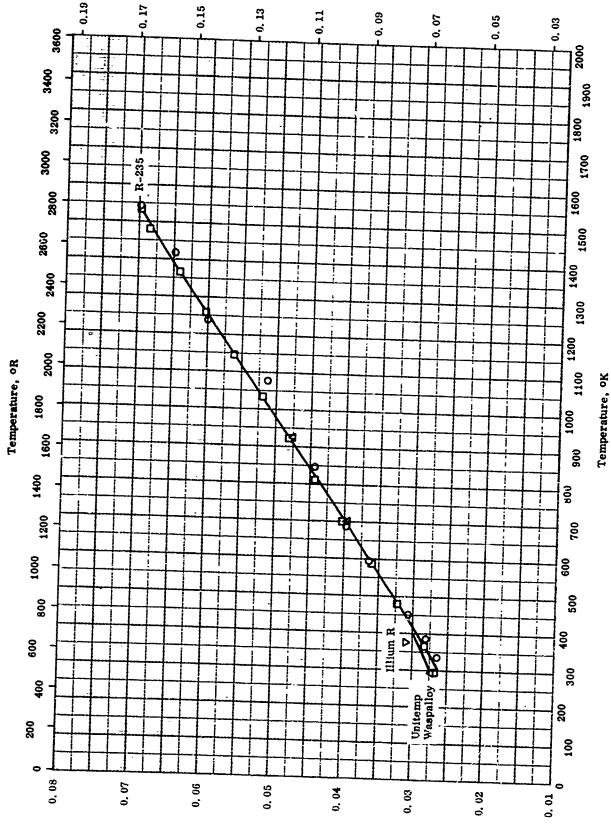
Temperature, oK

Thermal Conductivity, cal Sec-1 cm-1 K-1

SERVING CONTROL OF THE PARTY OF

THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + ΣX_i (55 < Ni < 60)

Remarks				Quenched in water from 1050 C and then tempered in air at 720 C for 1 hr.	Sample contained 5 vne-inch dia disks.				
Sample Specifications	Hastelloy C; 56.07 Ni, 15.83 Cr, 14.57 Mo, 4.94 Fe, 4.41 W, and 0.07 C.	Nimonic 90; 58.86 Ni, 19.5 Cr, 16.5 Co, 2.45 Ti, 1.40 Al, 0.65 Si, 0.41 Fe, 0.14 Cu, 0.06 C, and 0.03 Mn.	Nimonic 35; 57.71 Ni, 19.1 Cr, 16.5 Co, 2.91 Ti, 1.99 Al, 0.65 Si, 0.38 Fe. 0.10 C, 0.06 Cu, rnd 0.06 Mn.	Okh 20 N 60 B (USSR design.); 59.64 Ni, 20.4 Cr, 17.7 Fe, 1.59 Mn, 0.58 Nb, 0.25 Si, 0.06 C, and 0.004 S.	M 252; 57.15 Ni, 18.65 Cr, 9.98 Mo, 9.75 Co, 2.74 Ti, 1.17 Al, 0.3 > Fe, 0.12 C, 0.07 Mn, and 0.06 Si.	Illium G; 56.0 Ni, 22.5 Cr, 6.5 Cu, 6.3 Fe, 6.4 Mo, 1.25 Mn, 0.65 Si, and 0.2 C.	J-1566 (M-252); 55.85 Mi, 20 Cr, 10 Co, 10 Mo, 3 Ti, 1 Al, and 0.15 C; density 0.298 lb in-3.	Waspalloy; 57.0 Ni, 19.75 Cr, 13.5 Co, 4.5 Mo, 3.0 Ti, 1.35 Al, 0.75 Fe, 0.07 C, 0.06 Zr, 0.04 Si, 0.02 Mn, 0.007 S, and 0.005 B; density 0.296 lb in-3.	Hastelloy R-235; 59.8 Ni, 15.5 Cr, 10 Fe, 5.5 Mo, 2.5 Co, 2.5 Ti, 2 Al, 1 Mn, 1 Si, and 0.16 C; density 0.296 lb in-3.
Rept. Error%	ß			# 27	۸ ت				
Temp. Range ^O K	876-1348	323-1073	323-1073	323-971	386-1427	373	294-1089	294-922	311-1144
Ref.	58-2	9-09	9-09	63-2	61-2	58-11	57-11	59-6	58~16
Sym	0	0	٥	٥	♦	>	4	•	8



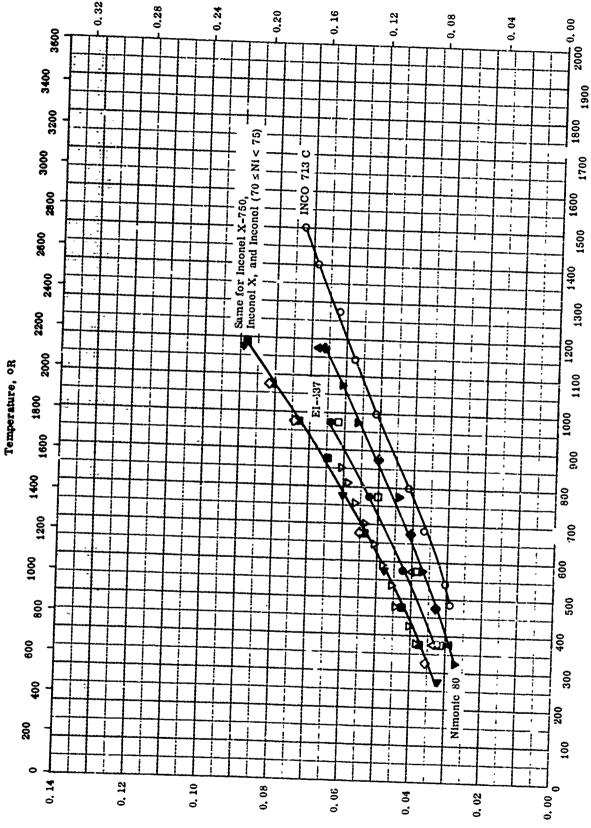
THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + Σx_i (60 $\leq Ni < 70$)

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

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THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + ΣX_1 (60 s Ni < 70)

				
Remarks	Measured in He atm.			
Sample Specifications	Hastelloy R235; 14-17 Cr., 9-11 Fe, 4.5-6.5 Mo, 2.25-2.75 Ti, 1.75-2.25 Al, and 2.5 max Co.	Same as above.	Unitemp Waspulloy; 60.61 min Ni, 18-21 Cr, 12-15 Co, 3-5 Mo, 2.75-3.25 Ti, 2.0 max Fo, 1.0-1.5 Al, 0.75 Si, 0.5 Mn, 0.1 max C, 0.1 max Cu, 0.02-0.15 Zr, 0.03 max S, and 0.001-0.01 B.	1llium R; 64 Ni, 22 Cr, 6.0 Fe, 5.0 Mo, 2.5 Cu, 0.3 Mn, 0.15 Si, and 0.05 C.
Rept. Error %				
Temp. Range ok	336-1544	372-1478	294-922	37.3
Ref.	58-7	62-6	61-5	58-11
E Soli	c	0	٥	D



THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + ΣX_1 (70 s Ni < 75)

Temperature, ok

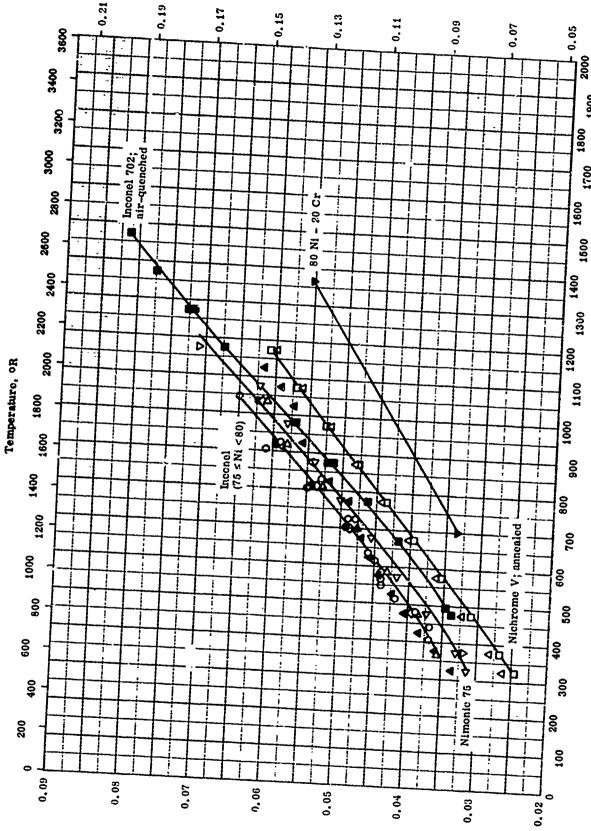
Thermal Conductivity, cal Sec-1 cm-1 K-1

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THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + $\Sigma X_{\rm I}$ (70 < ni <75)

 Ref.	Temp.	Rept. Error %	Sample Specifications	Romarks
 61-2	486-1501	۷ د	INCO 713 C; 71, 53 Ni, 11, 0 Cr, 6, 5 Al, 5, 0 Fe, 3, 5 Mo, 1, 0 Mn, 1, c Si, 1, 0 Nb + Tu, 0, 25 Ti, and 0, 20 C.	Samplo contained 5 one-inch dia disks.
 29-3 20-3	322-1172		Inconel X 750; 70 min Ni, 14-17 Cr, 5-9 Fo, 2. 25-2. 75 Ti, 1. 20 max Mn, 0. 7-1. 2 Nb, 0. 4-1. 0 Ai, 0. 5 max Cu, 0. 5 max Si, 0. 2 max Co, and 0. 08 max C.	
 56-3	373-1173		Nimonic 80/80A; 71 Ni, 20 Cr, 5.0 Fc, 1.8-2.7 Ti, 0.5-1.8 Ai, 1.0 max Mn, 1.0 max Si, 0.2 max Cu, and 0.1 max C.	
 57-6	378-850		Inconel X; 73 Ni, 15 Cr, 7.0 Fe, 2.5 Ti, 1.0 Nb. 0.7 Al, 0.5 Mn, 0.4 Si, and 0.04 C; nominal composition from Metal's Handbook.	
59-5	323-1173		Same as above.	
 28-D	373-973	3.0	EL-437 (USSR design.); 74.5 Ni, 20.9 Cr, 2.28 Tl, 0.70 Si, 0.46 Mn, 0.40 Al, and 0.05 C.	
 58-9	373-973	3.0	Same as above.	Tempered at 850 C for 100 hrs.
28-N	373-973	3.0	Sume as above.	Tempored at 850 C for 2000 hrs.
 9-09	323-1173		Nimonic 80; 73.66 NI, 21.0 Cr, 2.5 Ti, 1.20 AI, 0.6 Mn, 0.5 Fe, 0.5 Si, and 0.04 C.	
52-5	573-1173		Nimonic 80; 72, 8 Ni, 21, 4 Cr, 3, 08 Fe, 2, 34 Ti, and 0, 38 Al.	Heat to 1080 C for 8 hrs and aged at 700 C.
50-4	273-1173		Inconol; 73, 19 Ni, 14, 38 Cr., 6, 95 Fe, 0, 83 Al, 0, 47 Mn, 0, 39 Si, 0, 03 C, 0, 03 Cu, and 0, 007 S.	



THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + ΣX_1 (75 < N1 < 80)

Temperature, oK

Thermal Conductivity, cal Sec-1 cm-1 K-1

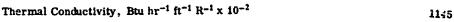
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THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + Σx_l (75 sni < 80)

E S	Ref.	Temp. Range ok	Rept. Error%	Sample Specifications	Remarks
0	59-4	405-1044	+	Inconel; 75, 92 Ni, 15, 38 Cr, and 8, 70 Fe.	In wrought form.
0	63-2	323-1173	ai 	Nichrome V; 77.94 Mi, 19.87 Cr, 1.44 Si, 0.06 Mn, and 0.036 Fe.	Annoaled at 950 C.
٥	53-2	323-1173	0 4	Inconol; 78. 13 Ni, 13. 94 Cr, 6. 33 Fe, 0. 33 Si, 0. 32 Mn, and 0. 30 Co.	Annoaled at 1050 C.
D	55-3	373-1173		Nimonic 75; 20 Ni, 2.4 Fo, 1.0 max Mn, 1.0 max Si, 0.5 max Cu, 0.2-0.6 Ti, and 0.08-0.15 C.	
▽	9-09	323-1073	~	Nimonic 75; 77.87 Ni, 20.53 Cr, 0.79 Si, 0.27 Mn, 0.23 Ti, 0.126 C, 0.12 Fe, and 0.06 Cu.	
Δ	4- 22- 24- 24- 24- 24- 24- 24- 24- 24- 2	366-1033	+	Incovol; 75.99 Ni, 14.42 Cr, 8.87 Fo, 0.28 Mn, 0.22 Cu, 0.17 Si, 0.02 C, and 0.007 S; Rockwell superficial hardness (15 T reale) 78.	Annealed at 2050 F followed by cooling in quiescent air.
♦	- 3G	366-1033	\$ #	Inconel; 76.45 Ni, 14.96 Cr, 7.89 Fo, 0.26 Mn, 0.19 Si, 0.15 Cu, 0.07 C, and 0.007 S; Rockwell superficial hardness (16 T scale) 80.	Somo as above.
•	99	366-1033	ය #	Inconel; 75.64 Ni, 15.32 3r, 8.17 Fe, 0.33 Mn, 0.21 Si, 0.19 Cu, 0.11 C, and 0.007 S; Rockwell superficial hardness (15 T scale) 83.	Same as above.
8	62-10	473-1473		Inconol 702; 79.3 Ni, 17.0 Cr., 2.6 Al, 0.59 Ti, 0.36 Fo, 6.19 Si, 0.14 Cu, 0.08 Co, 0.066 C, and 0.05 Mn.	Heated at 1080 C for 1 hr and air-cooled rajidly; machined into a right cylinder with recess as at either end.
				(Continued onto next page)	

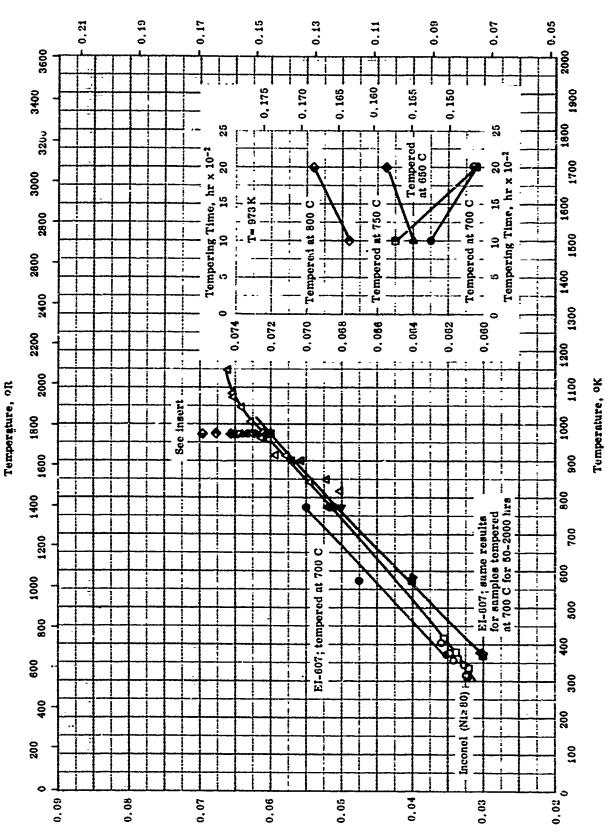
THERMAL CONDI CTIVITY ... MICKEL +CHROMIUM + $\tau_i X_i$ (Coutinued) (75 % Ni < 80)

Remarks	Water-quenched from 1100 C.	
Sample Specifications	EL-435 (USSIR design.); 77.33 Ni, 21.1 Cr., 0.56 Fe, 0.49 Mn, 0.32 Si, 0.23 Ti, 0.06 C, 0.006 S, 0.005 P, and trace of Cu.	Mn, and trace P; density 8.35 gcm ⁻³ . Mn, and trace P; density 8.35 gcm ⁻³ .
Rept. Error%	31 -i	2
Тетр. Капке оК	323-1123	700-1367
Ref.	63-2	27
Son Son	4	>



THERMAL CONDUCTIVITY ... NICKEL + CHROMIUM + Σx_1

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Thermal Conductivity, cal Sec-1 cm-1 K-1

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Thermal conductivity -- nickel + chromium + \mathfrak{D}_{X_1} (ni =80)

E og	Rof.	Temp. Range ok	Ropt. Evror%	Sample Specifications	Remarks
0	53-7	317-407	£3 +:	Inconel; 80 Ni, 15 Cr, and 5 Fe; nominal composition from Metal's Handbook.	
0	53-7	317-417	i i	Same as above.	
٥	58-8	818-1140		Same as above.	
>	58-9	973	9.0	EI-007 (USSR design.); 80. 95 Ni, 16. 4 Cr. 1.67 Nb, 0.55 Al, 0.50 Mn, 0.49 Tl, 0.42 Si, and 0.02 C.	Heated to 1100 C for 5 hrs and water-quenched.
∇	08-0	97:	ဝ ဗ်	Same as above.	The above sample again heated to 1000 C for 2 hrs and air-cooled.
Δ	58-9	97:3	3.0	вато ан авоче.	The above sample again heated to 900 C for 1 hr and at 800 C for 2 hrs.
 \tau \tau \tau \tau \tau \tau \tau \tau	58-0	973	3,0	Same us above,	The above sample heated again at 750 C for 20 hrs.
•	28-9	373-973	0.0	Same us above.	Tompered at 700 C.
	28-9	373-973	3,0	Sume as above.	The above sample again tempered at 700 C for 50 hrs.
4	589	373-973	0.5	Same as above.	The above sample again tempered at 700 ${\mathcal C}$ for 200 hrs.
5	6-85	373-973	3.0	Sume as above.	The above sample again tempered at 700 C for 1000 hrs.
V	58-9	973-973	0.5	Same us above.	The above sample again tempered at 700 C for 2000 hrs.
				(Continued onto next page)	

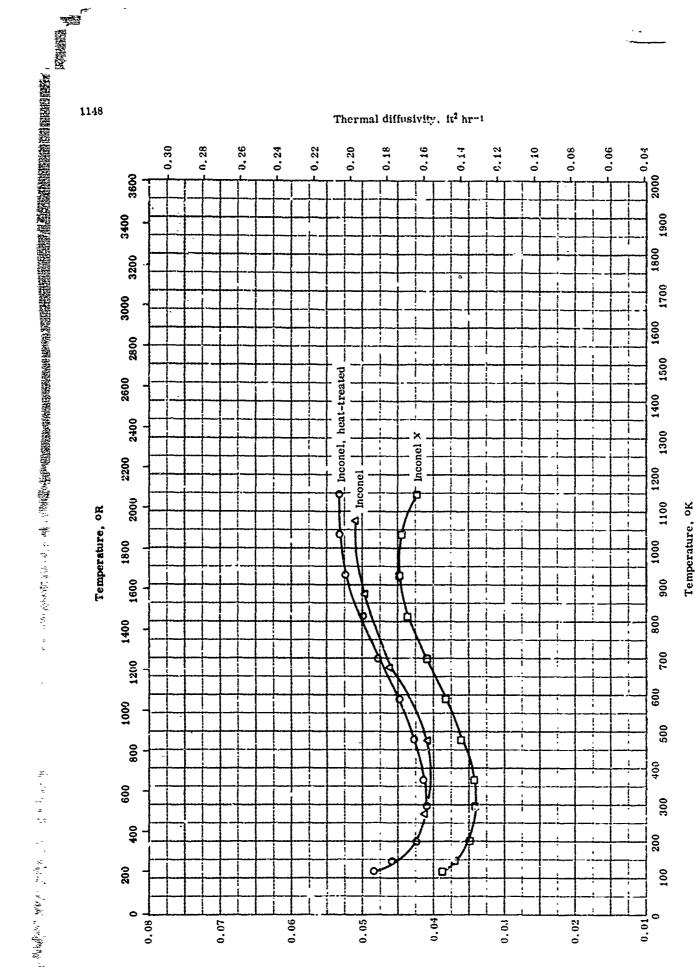
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THERMAL CONDUCTIVITY -- NICKEL + CHROMIUM + r_{X_1} (Continued) (Ni \approx 80)

Remarks	Tempered at 650 C for 1000 hrs.	Tempered at 650 C for 2000 brs.	Tempered at 700 C for 1000 hrs.	Tempered at 700 C for 2000 hrs.	Tempered at 750 C for 1000 hrs.	Tempered at 760 C for 2000 hrs.	Tempered at 800 C for 1000 hrs.	Tempered at 800 C for 2000 brs.	
Sample Specifications	Same as above.	Sume as above.	Sume an above.	Вате ая вроуе.	Same as abovo.	Вате пя проус.	Эпто ин проус.	Same an above.	
Error%	0.8	0.8	0::	3.0	0.0	0.8	0.E		
Ranke ok	973	973	973	973	073	073	67.0	973	
- 5			÷	0-89	0H-0	0-H0	0-80	0-89	
Rof. Ran	88-88	0-80	0-89	80	ĕ	ā	ä	ĕ	

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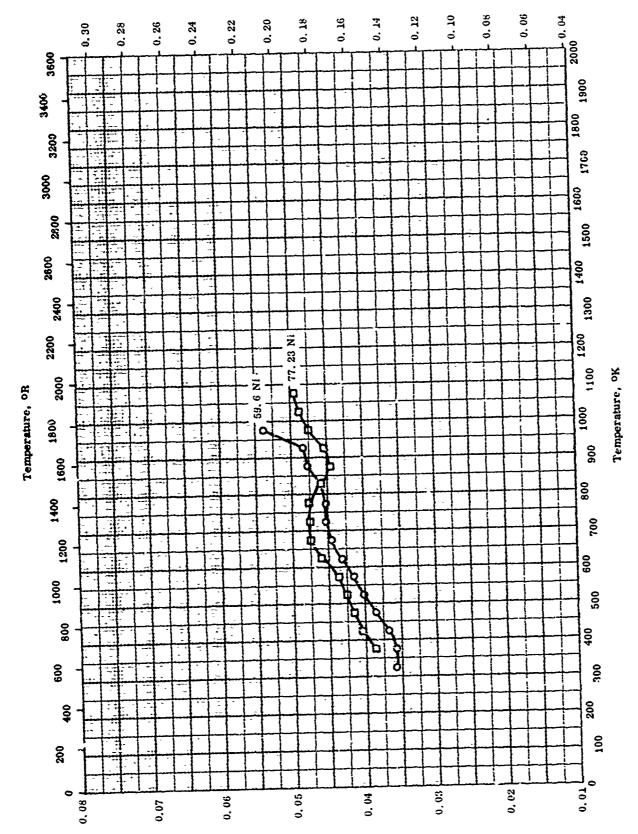


THERMAL DIFFUSIVITY -- NICKEL + CHROMIUM + Σ_{i} (Incomed)

Thermal diffusivity, cm2 Sec-1

THERMAL DIFFUSIVITY -- NICKEL + CHROMIUM + ΣX_i (inconci)

Remarks		Hot rolled; annealed at 1600 F for 3 hrs, 1800 F for 15 min, and then air evoled.	Hot rolled; solution treated at 2100 F for 3 hre and and air cooled, then double aged at 1550 F for 24 hrs respectively and both followed by air cooling.
Sample Specifications	Inconel; 78 Mi, 15 Cr, 7 Fe, 6.35 Mn, 0.20 Si, and 0.04 C.	Inconel; 78.92 Ni, 62 Cr, 5.8 Fu; 0.23 Mn, 0.19 Si, 0.12 Cu, 0.09 C, 0.007 S.	Inconel X; 72. 94 Ni, 14.65 Cr, 6.97 Fc, 2.44 Ti, 1.01 Nb, 0.93 Al, 0.54 Mn, 0.46 Si, 0.03 C, 0.02 Cu, and 0.007 S.
Rept.			
Temp.		116-1144	116-1144
Ref.	56-1	58-1	28-1
Sym	٥	0	0



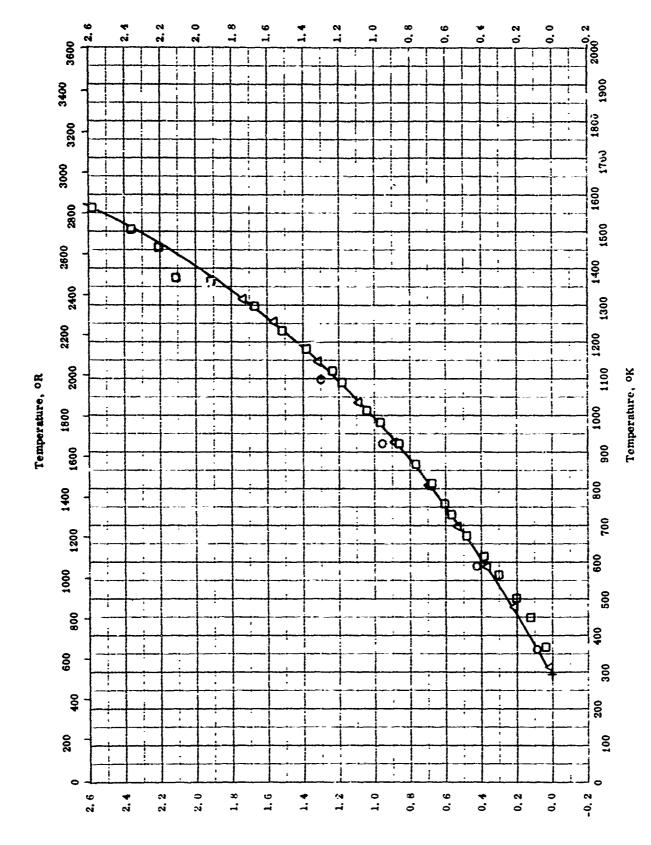
Thermal diffusivity ... nickel + chromium + Σ_1

Thermal diffusivity, cm² Sec-1

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THERMAL DIFFUSIVITY -- NICKEL + CHROFIUM + ΣX_1

Remarks	Quonched in water from 1050 C and then tempered at 720 C for 1 hr in air.	Quench in water from 1100 C.
Sample Specifications	Okh 20N60B (USSR design.); 59, 64 Ni, 20, 4 Cr, 17, 7 Fe, 1, 59 Mn, 0, 58 Nb, 0, 25 Si, 0, 06 C, and 0, 004 S.	Okh 21N78 T (EI-435, USSR design.); 77.23 Ni, 21.1 Cr, 0.56 Fe, 0.49 Mn, 0.32 Si, 0.23 Ti, 0.06C, 0.006 S, 0.005 P, and traces of Cu.
Rept. Error %	T.	#
Temp. Rarge ^o K		373-1073
Ref.	63-2	ය - දු
Sym	0	0



THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + ΣX_1 (11 - 16 Cr and 3, 5 - 6, 5 A1)

Thermal Linear Expansion, percent

TPRC

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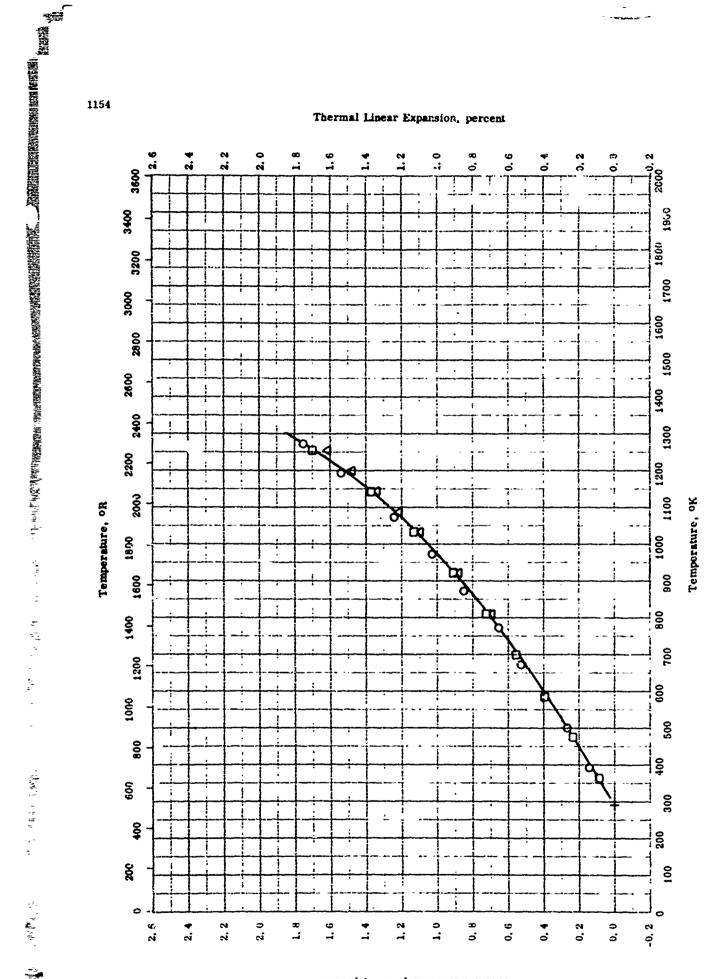
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THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + ΣX_1 (11-16 Cr and 3.5-6.5 Al)

Remarks	Estimated from existing data on inconel X by author.		
Sample Specifications	Inco 702; nominal: 78 Ni, 16 Cr, 3.5 Al, 0.5 Tl, and 0.03 C; density 0.295 lb in3	Inco 713C; 71. 53 Ni, 11. 0 Cr, 6. 5 Al, 5. 0 Fe, 3. 5 Mo, 1. 0 Si, 1. 0 Mn, 1. 0 Nb + Ta, 0. 25 Ti and 0. 20 C; density 9. 23 g cm ⁻³	Haynos Alloy No. 713C; nominal; bal Ni, 12. 00 - 14. 00 Cr, 5. 50 - 6. 50 Al, 3. 80 - 5. 20 Mo, 1. 80 - 2. 80 Nb + Ta, 2. 50 Fe, 1. 00 Co, 0. 50 - 1. 00 Ti, 0. 50 Cu, 0. 50 Si, 0. 25 Mn, 0. 03 - 0. 20 C, 0. 05 - 0. 15 Zr, 0. 015 S, and 0. 005 - 0. 015 B; density 7. 91 g cm ⁻³ and M. P. 1286 - 1342 C.
Rept. Error %			
Temp. Range og	294-1096	300-1562	311-1311
Ref.	56-43	61-2	63-22
Sym	0	0	4

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THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + Σx_1 (18 - 20 Cr and 10 - 20 Co)

Thermal Line ir Expansion, percent

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THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + Σx_i (18 - 20 Cr and 10 - 20 Co)

Remarks	Annealed 3 hrs at 1000 C in pure dry hydrogen, furnace cooled at 150 C hr ⁻¹ rate from 1000 C to 600 C, then at 85 C hr ⁻¹ rate to 20 C; author also place second heating and cooling data to	Expansion test made on wrought stock solution- treated 4 hrs at 1975 F, air cooled, aged 24 hrs at 1650 F, air cooled, aged 16 hrs at 1400 F, and air cooled again.	Avernge duta of wrought and cast forms of alloy.
Sample Specifications	Waspalloy; 55.45 Ni, 19.22 Cr, 11.20 Co, 7.00 Mo, 2.49 Ti, 1.03 Al, 0.73 Fe, 0.67 Mn, 0.47 Si, 0.45 C, 0.12 Cu, 0.015 P, and 0.008 S.	Hastelloy 500: 18,00-20,00 Cr, 16,00-20,00 Co, 3,00-5,00 Mo, 2.75-3.25 Al, 2.75-3,25 Tl, 2.00 Fa, 0.30 Sl, 0.20 Mn, 0.10 C, 0.10 Cu, 0.015 P, 0.015 S, and 0.003-0.010 B; dunsity 0.200 lb in. 3 and M, P, 2375-2450 F.	Hi, nes zitay No. R-41; 18, 00 - 20, 00 Cr, 10, 00 - 12, 00 Co, 9, 00 - 10, 50 Mo, 6, 00 Fe, 3, 00 - 3, 30 Ti, 4. 40 - 1, 80 Al, 0, 50 Si, 0, 50 Mn, 0, 05 - 0, 12 C, 0, 015 S, and 0, 003 - 0, 010 B; density 8, 25 g cm ⁻³ and M. P. 1310 - 1345 C.
Rept. Ervor%			
Temp. Range oK	379-1273	273-1266	294-1256
Ref.	67-62	4- 5	63-24
Sym	0	C	٥

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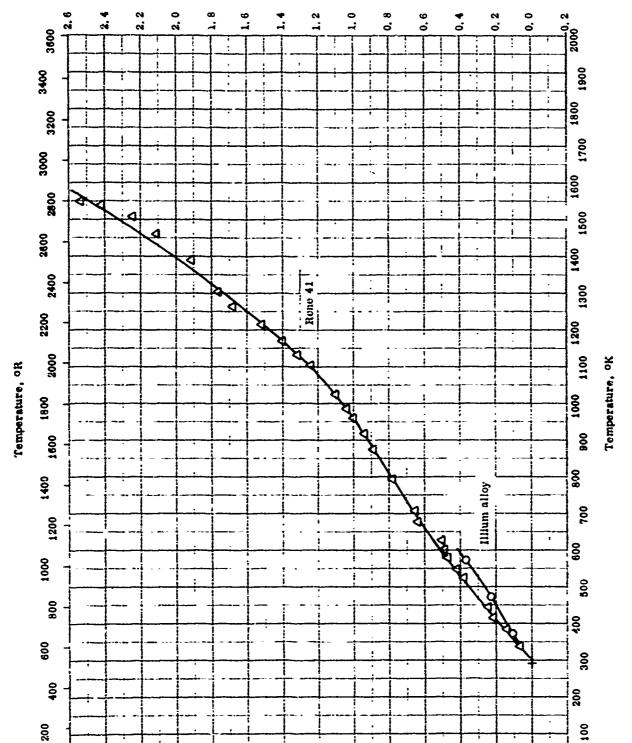
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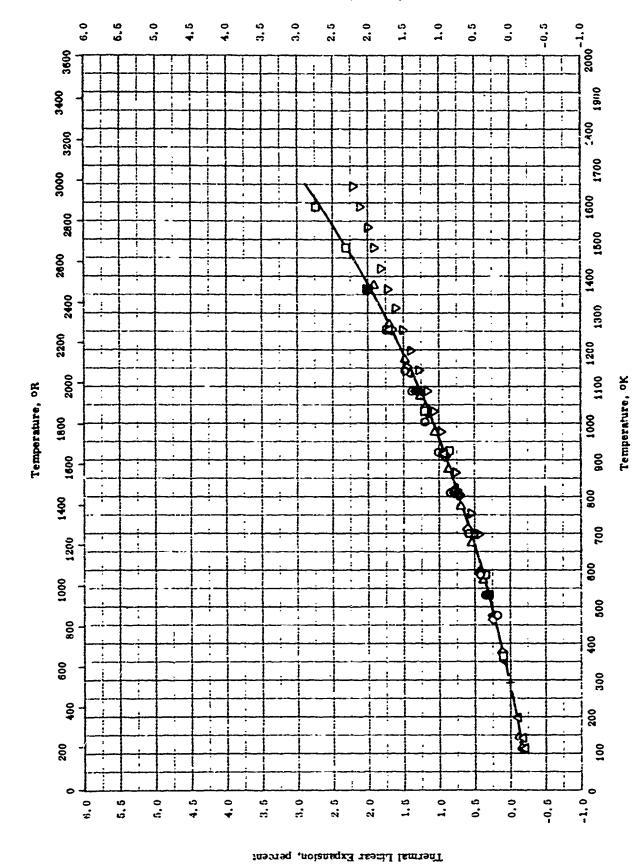


THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + Σx_1 (18 - 24 Cr and 7 - 11 Cu)

Thermal linear expansion -- nickel + chromium + Σx_1 (18 - 24 Cr and 7 - 11 Cu)

Remarks	Cast.	Solution-treated at 1975 F and water-quenched,
Sample Specifications	Illium alloy; 59.0 Ni, 24.0 Cr, 7.0 Cu, 4.0 Mo, 2.0 W, 1.6 Mn, Si each, and 1.0 Ag.	Rone 41 (GE-J 1610); 64, 60 Ni, 18, 60 Cr, 10, 73 Cu, 9, 63 Mo, 3, 14 Ti, 1, 54 Fo, 1, 49 Al, 0, 11 C, 0, 08 Mn, and 0, 07 Si; density 8, 08 g cm ⁻³ .
Rept.		
Temp.	1	294-1662
Ref.	67-52	61-3
Sym	0	٥

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THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + ΣX_1 (14 - 17 Cr and 3 - 8 Fe)

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THERMAL LINEAR EXPANSION -- NICKEL, +CHROMIUM + Σx_1 (14 - 17 Cr and 3 - \times Fe)

Sym	Ref.	Temp, Range ^o K	Ropt. Error%	Sample Spacifications	Петинк
С	46-0	311-1146		Inconel X; Nominal; 70 min Ni, 14 - 16 Cr, 5 - 9 Fe, 2, 25 - 2, 75 Ti, 0, 7 - 1, 2 Nb, 0, 4 - 1, 0 Al, 0, 3 - 1, 0 Mn, 0, 50 max 81, 0, 20 Cu, 0, 08 C, and 0, 01 S,	
0	91-10	293-1689		Inconel X; 74, 5 M, 14, 5 Cr, 7, 0 Fe, 2, 5 Tl, 1, 9 Nb, 0, 48 Mn, 0, 48 M, niki 0, 05 C.	
٥	31-6 13-6 13-1	1171266		Inconel X; 72, 94 Mi, 14, 66 Cr, 6, 97 Fe, 2, 44 Ti, 1, 01 Nb, 0, 93 Ai, 0, 64 Mn, 0, 46 Si, 0, 03 C, and 0, 02 Cu; donaty 516 lb R ⁻³ .	Hot rolled; solution treated 3 hrs at 2100 F, air cooled, aged 24 hrs at 1550 F, then 20 hrs at 1300 F; air cooled; tested in vacurm,
◊	31-0 ulno 1-7-	1171266		Inconet; 78,92 Nt, 14,62 Cr, 5,80 Fe, 0,23 Mn, 0,19 St, 0,09 C, and 0,007 St density 529 lb ft ⁻³ ,	Not rolled; annealed 3 arm at 1600 F, 15 min at 1800 F, air cooled.
D	5k- tu	20% 1644	\$ \$	Inconel X; 73, 63 M (by dtft.), 14, 04 Cr, 7, 03 Fe, 2, 73 Tl, 0, 67 Mn, 0, 57 Nh, 0, 56 Al, and 0, 41 Sl; denatty 8, 20 g cm ⁻³ ,	Tesked in encuum with a bouting rate at 3 = 6 F min - 1,
చ	6-1-10	2731-1273	-	E1-d07 (Rusedan deedga.); hal M. 16 - 17 Cr. 3.0 Fc. 1.7 - 2.1 Tl, 1.0 - 1.6 Mb, 1.0 Mn, 1.0 Sl, 0.6 - 1.0 Al, and 0.07 C.	
•	F	204-1089		Inconed 600; formerly "Inconed Alloy" from international Nicked Co.; nominal: 76,0 Ni, 16, 8 Cr., 7,20 Fe, 0,20 Mn, 0,30 Si, 0,10 Cu, 0,04 C, and 0,007 S; density 0,304 Ib In, 3 and M. P. 2500 - 2500 F.	
				(continued onto next pugo)	

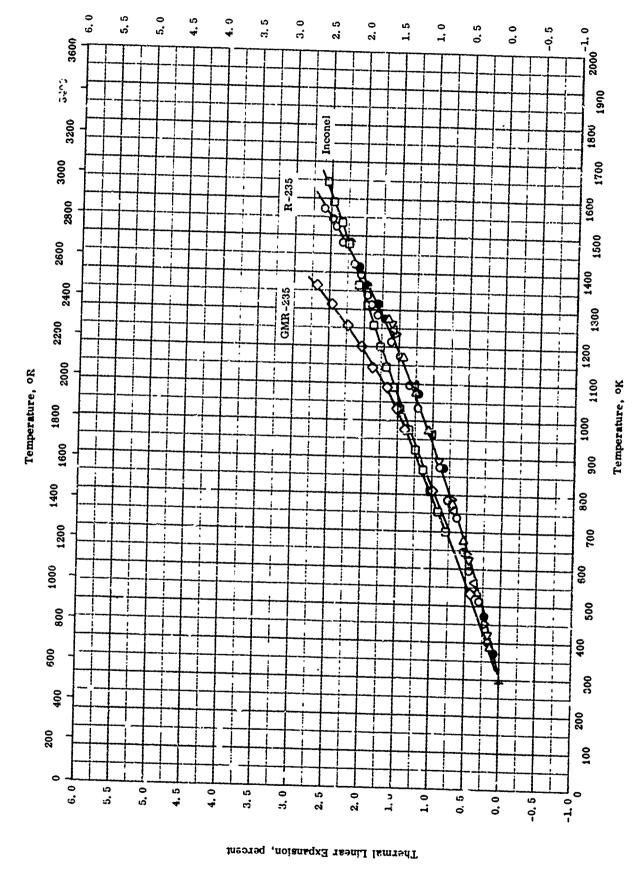
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THERY AL LINEAR EXPANSION -- NICKEL + CHROMIUM + ΣX_1 (Continued) (14 - 17 Cr and 3 - 8 Fe)

REFERENCE INFORMATION

Rept. Error %				
. 3				
Sample Specifications	Inconel 604; formerly "Inconel 690" from International Nickel Co.; nominal: 74.0 Ni, 15.8 Cr. 7.20 Fe, 2.0 Nb, 0.20 Mn, 0.20 Si, 0.10 Cu, 0.04 C, and 0.007 S; density 0.305 lb in.	Inconel ?2'; tormerly "Inconel M" from international Nickel Co.; nominal: 71.0 Ni, 16.0 Cr, 7.20 Fe, 3.00 Ti, 2.25 Mn, 0.12 Si, 0.10 Cu, 0.04 C, and 0.007 S; density 0.298 lb in3	Inconel 722; formerly "Inconel W" from International Nickel Co.; nominal: 75.0 Ni, 15.0 Cr, €.50 Fe, 2.40 Ti, 0.60 Al, 0.55 Mn, 0.20 Si, 0.05 Cu, 0.04 C, and 0.007 S; density 0.298 lb in. 3 and M. P. 2540 - 2600 F.	Inconel X - 750; formerly "Inconel X" from Internal Nickel Co.; nominal: 73.0 Ni, 15.0 Cr, 6.75 Fe, 2.50 Ti, 0.85 Nb, 0.80 Al, 0.70 Mn, 0.30 Si, 0.05 Cu, 0.04 C, and 0.007 S; density 0.298 lb in, -3 and M. P. 2540 - 2600 F.
Remarks				

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THERMAL LINEAR EXPANSION --- NICKEL + CHROMIUM + Σx_{j} (14 - 17 Cr and 8 - 12 Fe)

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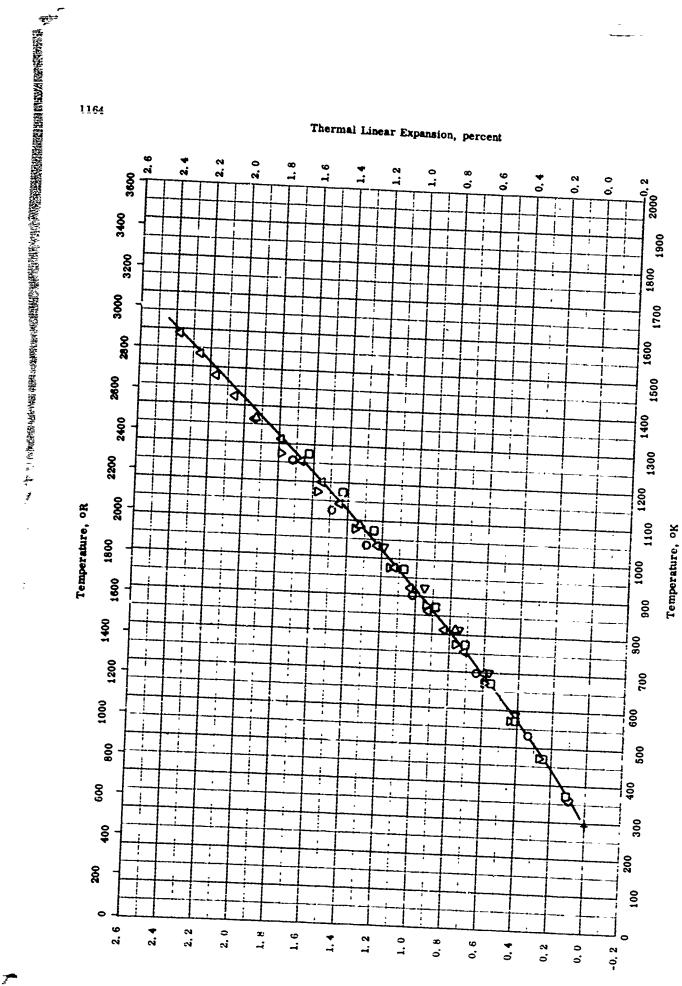
THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + $\Sigma X_{\rm I}$ (14 - 17 Cr and 8 - 12 Fe)

Sym	Ref.	Temp. Range ok	Rept. Error %	Sample Specifications	Remarks
Δ	57-52	293-1273		Inconel; three samples	Hot rolled and machined, annealed by rapid
	_			a) 75, 99 NI, 14, 42 Cr, 8, 87 Fe, 0, 28 Mn, 0, 22 Cu, 0, 17 SI,	insertion into preheated furnace at 2050 F for
			_	0.02 C, and 0.007 S.	9-1/4 min, and cooled in quiescent air; heating
				b) 75, 64 Ni, 15, 32 Cr, 8, 17 Fe, 0, 33 Mn, 0, 21 Si, 0, 19 Cu,	data; average of three samples plotted, max
				0. 11 C and 0. 007 S.	deviation of ±0, 6%.
				c) 76.46 E1, 14.96 Cr, 7.89 Fe, 2.6 Mn, 0.19 SI, 0.15 Cu,	
				0. 07 C, and 0. 007 S.	
∇	57-52	293-1273		Sample (a) above.	Same heat treatment as above; cooling data.
٥	57-52	293-1273		Sample (b) above.	Same as above.
D	5752	293-1273		Sample (c) above.	Same as above.
0	58-7	390-1571		Hastelloy R-235; nominal: 66 Ni, 14-17 Cr, 9-11 Fe, 4.5-6.5 Mo, 2.25-2.75 Tl, <2.5 Co, 1.75-2.25 Al, <1 Mn, Si cach, and <0.16 C.	Tested in helium.
0	58-13	293-1644	: :	Inconel: 75.54 Ni (by diff.), 15.15 Cr, 8.24 Fe, 0.35 Ti, 0.30 Mn, 0.23 Si, 0.094 Co, 0.077 C, and < 0.02 Mo; density 8.40 g cm ⁻³ .	Tested in vacuum with a heating rate at 3 - 5 F min1.
•	62-6	295-1480		Hastelloy R-235; 62, 15-69, 15 Ni, 14, 00-17, 00 Cr, 9, 00-11, 00 Fe, 4, 50-6, 50 Mo, 2, 25-2, 75 Ti, 2, 50 Co, 1, 75-2, 25 Al, 0, 60 Si, 0, 25 Mn, 0, 16 C, 0, 010 P, and 0, 030 S; density 8, 22 g cm ⁻³ , M, P, 1351-1389 C, and electric resis-	
				tivity 133 microhm-cm at 22 C.	
				(Continued onto next page)	

THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + ΣX_i (continued) (14 - 17 Cr and 8 - 12 Fe)

REFERENCE INFORMATION

Remarks	Air-melted; data determined by Allison Div., General Motors Corp.
San ple Specifications	Haynes GMR-235; 57.89-68.53 Ni, 14.00-17.00 Cr, 8.00-12.00 Fe, 4.50-6.50 Mo, 2.50-3.50 Al, 1.50-2.50 Ti, 0.60 Si, 0.25 Mn, 0.10-0.20 C, and 0.025-0.07 B; density 8, 03 g cm ⁻³ and electral resistivity 137.3 microhm-cm at 25 C.
Rept. Error %	
Temp.	294-1366
Ref.	60-22
Sym	\diamond



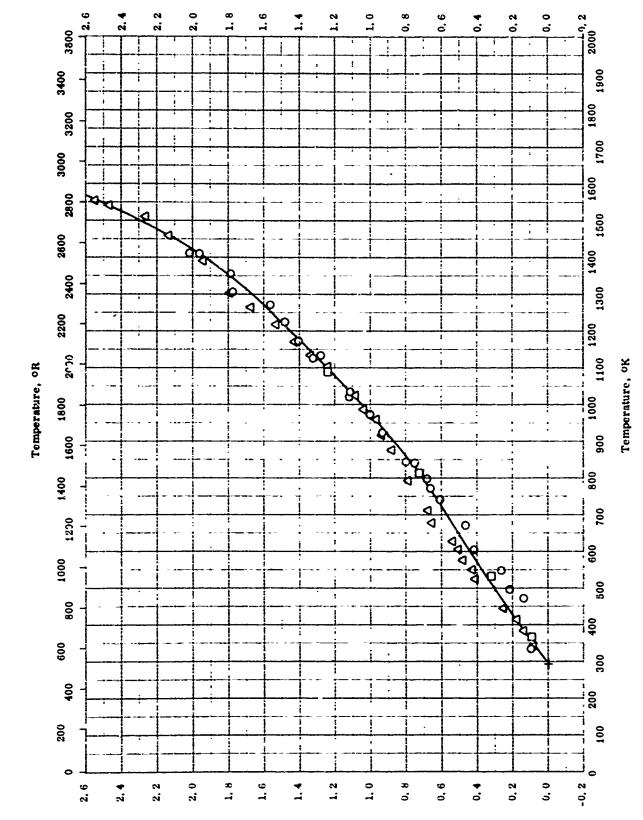
THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + $\Sigma X_{\rm I}$ (18 - 29 Cr and 12 - 25 Fe)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + ΣX_1 (18 - 29 Cr and 12 - 25 Fe)

Remarks	Arc-melted, cast, heat treated 24 hrs at 1800 F in vacuum; tested in vacuum; plotted data are average of two complete heating and cooling cycles.	Tested in vacuum with a heating rate at 3-5 F min1.		Average data of wrought and cast forms of alloy.			Vacuum-melted and precipitation hardened alloy.
Sample Specifications	75 (3E-62 Braze + 25 AISI 310; nominal; 56.88 Ni, 21.25 Cr., 12.80 Fe, 8.62 Si, < 0.06 C, and 0.50 > Mn.	Hastelloy X, 51, 15 NI (by diff.), 19, 79 Cr, 17, 95 Fe, 7, 43 Mo, 1, 58 Co, 0, 86 Sl, 0, 81 Mn, 0, 19 Tl, 0, 13 W, and 0, 11 C; density 8, 15 g cm ⁻³ .	Hastelloy X; 20, 50 - 23, 00 Cr, 17, 00 - 20, 00 Fe, 8, 00 - 10, 00 Mo, 0, 50 - 2, 50 Co, 0, 20 - 1, 00 W, 0, 050 - 0, 15 C, and 1, 00 max Si, Mn each; dentity 8, 23 gcm ⁻³ and M, P, 1288 C.	Hastelloy F; 44,00-47,00 Ni, 21,00-23,00 Cr, 16,48 Fe (by 451.), 5,5-7,5 Mo, 2,50 Co, 1,75-2,50 (Nb + Ta), 1,00-2,00 Mn, 1,00 Si, 1,00 W, 0,05-0,12 C, 0,50 Ta, 0,04 P, and 0,03 S; density 8,17 g cm ⁻³ and M. P. ~1288 C.	Incc .el 718; International Nickel Co.; nominal; 52, 5 Ni, 18, 6 Cr, 18, 5 Fe, 5, 0 Nb, 5 1 Mc, 0, 30 Ti, 0, 40 Al, 0, 30 Si, 0, 20 Mn, 0, 07 Cu, 0, 04 C, and 0, 007 S; density 0, 296 lb in, -3	Incoloy 804; International Nickel Co.; nominal: 42.6 NJ, 29.3 Cr. 25.4 Fe, 0.85 Mn, 0.50 Sl, 0.40 CJ, 0.40 Tl, 0.25 Al, 0.06 C, and 0.007 S; density 0.286 lb in3	Haynes Alloy No. 718.
Rept. Error%		ය VI					
Temp. Range ok	533-1256	293-1688	299-1273	293-1273	294-1306	294-366	296-1033
Ref.	53-25	58-13	61-26	62-27	65-4	65-4	65-6
Sym							



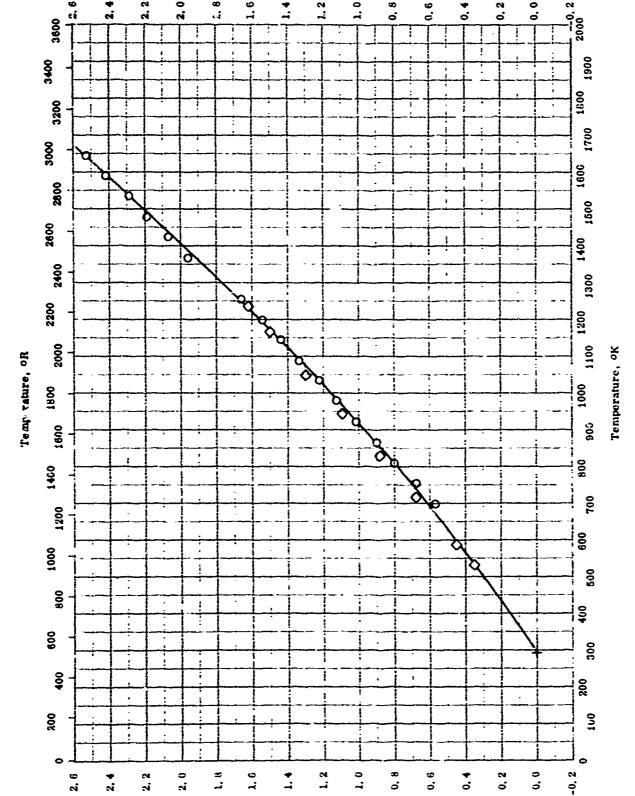
THERMAL LINEAR EXPANSION -- NICKEL, + CHROMIUM + ΣX_I (15 - 22 Cr and 3 - 15 Mo)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + $\Sigma x_{\rm I}$ (15 - 22 Cr and 9 - 15 Mo)

Renarks			Solution -treated at 1950 F and air cooled,
			led at 1950 F and air cooled.
		l at 1950 F and air cooled.	
ed at 1950 F and	ed at 1950 F and		
		olution -treate	
	:-1 -1		
	astelloy C; before test; 56, 07 NI, 15, 83 Cr, 14, 57 Mo, 4, 94 Fu, 4, 41 W, 0, 070 C; after test; 56, 00 NI, 15, 82 Cr, 14, 53 Mo, 5, 04 Fu, 4, 49 W, and 0, 068 C; density 556, 91b ft ⁻³ .	1-262 (GE J 1500); 57, 15 Ni, 18, 65 Cr, 9, 98 Mo, 9, 75 Cu, 2, 74 Ti, 1, 17 Ai, < 0, 30 Fe, 0, 12 C, 0, 67 Mn, and 0, 06 Sistensity 8, 22 g cm ⁻³ .	Inconel alloy 625; International Nickel Co.; nominal: 61. 0 Ni, 22. 0 Cr. 9. 0 Mo. 4. 0 Nb. 3. 00 Fe. 0. 30 St. 0. 15 Mn. 0. 10 Cu. 0. 05 C. and 0. 007 S; density 0. 305 lb in3
	before test; 56, 07 Ni, 15, 83 Cr, 14, 57 Mo, 41 W, 0, 070 C; after test; 56, 00 Ni, 15, 82 o, 04 Fe, 4, 49 W, and 0, 068 C; density 556, 3	98 Mo, 7 Mn, a	126; International Nickel Co.; nomin:) Mo, 4.0 Nb, 3.00 Fe, 6,30 St, 0.1; and 0,007 S; density 0,306 lb in. ⁻³
ttons	15, 83 (Bt. 56 068 C	6 0 0 0 0 0 0	91 Co. 3
Sample Specifications	Ni, J ter te	.8. 65 0. 12 C	Nicke 10 Fe, sity 0.
le Sye	56. 07 C; uf	N. I.	tonal , 3, 0
imp	. 070 -4. 49	7, 15 0, 30	ornat . o Mb
"	ore to W. O.	1500); 6 17 Al, < ; g cm ⁻³ .	5; Into 10, 4, ad 0. (
	; bef	J 150 1. 17 / 22 K c	9 626 9.0 M C, an
	loy C Fo	1-262 (GE J 2,74 Tl, 1. 1 density 8, 22	z2. 0 Cr., 9. Cu., 0. 05 C.
	Hastelloy C; 4, 94 Fu, 4, 14, 53 Mo,	M-262 (GE J 2, 74 T1, 1. density 8, 2;	Incone 22. 0 Cu,
.s.²			
Error %			
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Runge OK	300-1406	294-1'62	294-1089
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Ę.	58-2	61.2	65-4



THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + Σx_1 (19 - 20 Cr and 0, 6 - 11 SI)

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Thermal Linear Expansion, percent

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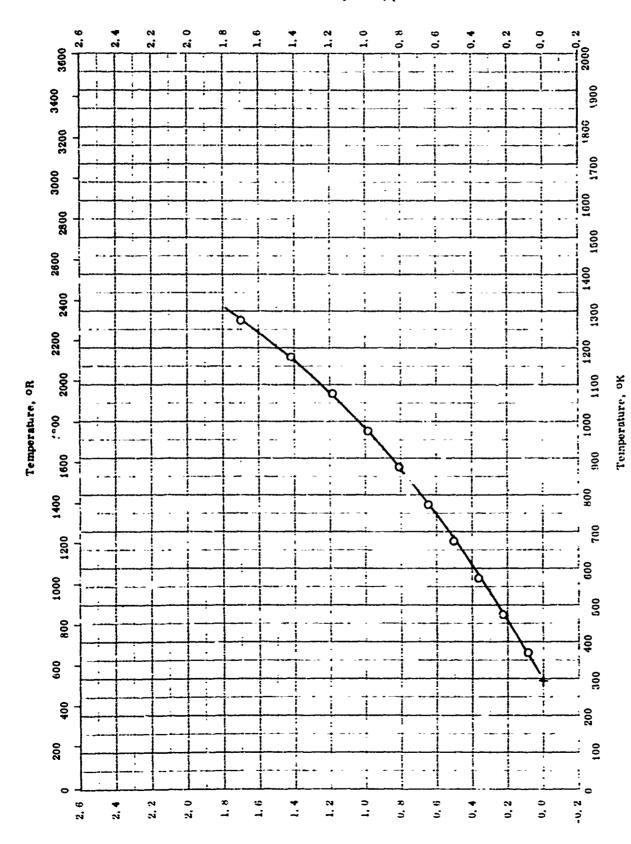
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THERMAL LINEAR EXPANSION -- MICKEL + CHROMIUM + ΣX_1 (19 - 20 Cr and 0, 6 - 11.81)

Remarks	Tested in vacuum with a heating rate at about 3-5 F min -i.	Arc-melted, cust, heat treated 24 hrs at 1800 F in vacuum; data are average of 2 complete heating and cooling cycles, also gives data for samples in as-cast condition; tested in vacuum.
Sample Specifications	79, 52 Ni (by diff.), 19, 33 Cr., n. 64 Si, 0, 31 C, 0, 17 Fe, 0, 63 Mn, trace of P, and nil 71; density 8, 35 gem ⁻³ .	GE-62 Brazing alloy (similar to J-8100); nominal; 69 Mi, 20 Cr, and 11 Si.
Rept. Error %	۸ ت	
Temp. Range of:	700-1644	533-1256
ltef.	58-13	5325
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THERMAL LINEAR EXPANSION -- NICKEL + CHROMIUM + ΣX_1 (13 - 16 3r and 5 - 7 W)

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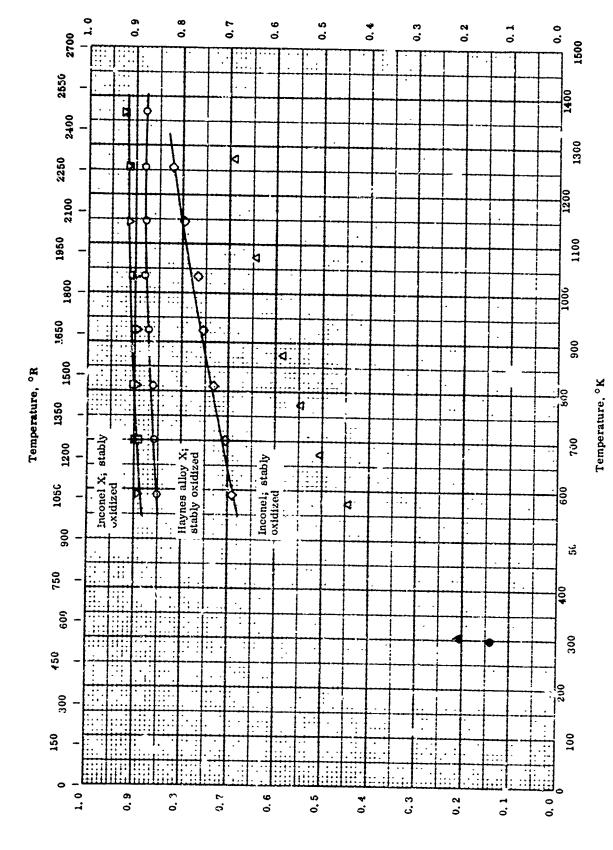
THERMAL IINEAR EXPANSION -- NICKEL + CHROMIUM + EX_I (13 - 16 Cr and 6 - 7 W)

REFERENCE INFORMATION

Renarks	Author enthanted 0, 02% difference in expansion coefficient for reference temperature at 0 C and 20 C.
Sample Specifications	ET-617 (Russian Donign.); bal M, 13 - 16 Cr, 5, 0 - 7, 0 W, 5, 0 Fe, 3, 0 Mo, 2, 0 Å, 2, 0 Ti, 0, 5 Mn, 0, 5 Si, 0, 5 V, and 0, 08 C.
Rept.	-
Temp. Runge ok	273-1273
Nerf.	04-10
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HEMISPHERICAL TOTAL EMITTANCE -- NICKEL + CHRONJUM + Σx_i

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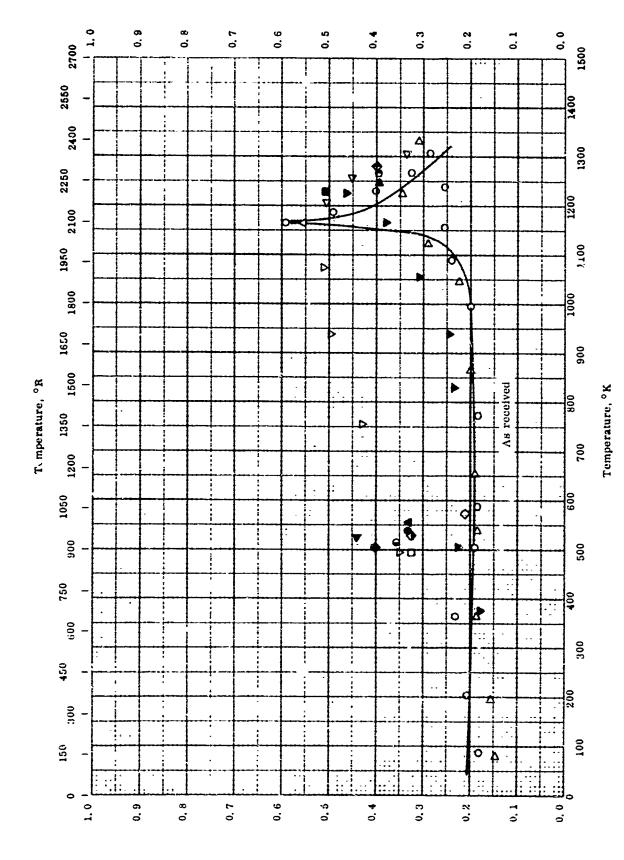
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Hemispherical total emittance -- nickel + chromium + Σx_i

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Remarks	Cleaned, polished, washed and stably oxidized in	air at 1366 K for 30 min,		Immersed in an etching solution, polished, and oxidized at 1366 K for 30 min.	Immersed in an etching solution, polished, oxidized from 0 to 1366 K over a period of 195 min.	15 Cr, 7 Fe, 0.25 Mn, 0.2 Cu, 0.25 Si, 0.08 C. Immersed in an etching solution, polished and stably oxidized in air at 1366 K for 9 min.	Clean and smooth surface; measured in air.	Dull finish; measured in air,	
Sample Specifications	Haynes alloy X: nominal 42 - 52 Ni, 20, 5 - 23 Cr., 17 - 20 e,	8 - 10 Mo, 1 max. Mn, 1 max. Si, 0.5 - 2.5 Co, 0.2 - 1.0 W,	Inconel, nominal: 76 Ni, 16 Cr and 8 Fe.	Inconel X. nominal: 70 min, 1:1, 14 - 16 Cr, 5 - 9 Fe, 2, 25 - 2, 75 Ti, 0.7 - 1, 2 Nb, 0.4 - 1, 0 Al, 0.3 - 1, 0 Mn, 0.5 max. Si, 0, 2 max, Cu, 0.08 max, C, and 0.01 max. S.	Inconel X,	Inconel; 77 Ni, 15 Cr, 7 Fe, 0.25 Mn, 0.2 Cu, 0.25 Si, 0.08 C, and 0.077 S.	Inconel,	Inconci.	
Rept. Error %				် V	رد ۷	۸ د			
Temp. Rraze ok	189-1366		573-1273	589-1366	700-1366	589-1255	290	303	
Ref.	59-17		55-35	57-50	57-50	57-50	48-7	45.7	
Sym Bol	0		4	D	D	♦	•	4	

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NORMAL TOTAL EMITTANCE -- NICKEL + CHROMIUM + Σx_i (inconel B)

Sormal Total Emittance

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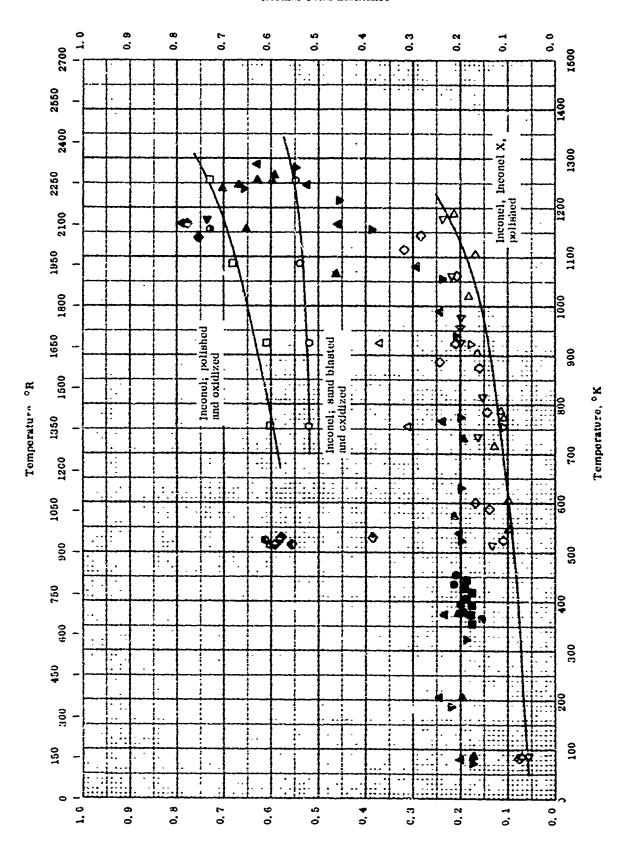
NORMAL TOTAL EMITTANCE -- NICKEL + CHROMIUM + Σx_1 (Income B)

Sym	Ret.	Temp. Runge OK	Rept.	Sumple Specifications	Remarks
0	54-27			Inconel B, nominal: 18 Cr, 9, 5 Fe, 1 Mn, 0.15 C.	As received, wiped; measured in helium (10 microns pressure); eyele I heating,
0	54-27	+0.4		Same as above.	The above specimen, cycle I cooling.
∢	54-27	1164		Sume us above.	The above specimen, cycle 2 heating.
D	54-27	497-1072		Same as above.	The above specimen, cycle 2 cooling.
Δ	54-27	80-1330		Inconel B.	Scrubbed, washed, and wheel; measured in helium (10 microns pressure); eyele I heating.
\(\)	54-27	572		Same as above.	The above specimen, cycle 1 cooling.
▽	5-4-27	1265-1305		Same as above.	The above specimen, cycle 2 heating.
•	54-27	230		Same as above.	The above specimen, cycle 2 cooling.
	54-27	1230	- .	Same as above,	The above specimen, cycle 3 heating.
4	54-27	535	-	Same as above.	The above specimen, cycle 3 cooling.
•	54-27	2521 - 68		Inconel B,	Polished to a mirror like fluish, washed; measured in hellum (10 microns pressure); eyele 1 heating.
•	54-27	202		Same as above.	The above specimen, cycle I cooling.
<u> </u>	54-27	1247		Same as above.	The above specimen, cycle 2 heating.
▼	54-27	222		Same as above.	The above specimen; cycle 2 cooling.
*	54-27	1280		Same as above,	The above specimen; cycle 3 heating.
				(continued onto next puge)	

NORMAL TOTAL EMITTANCE -- NICKEL + CHROMIUM + Σ_{X_1} (Continued) (inconel B)

REFERENCE INFORMATION

Remarks	The above specimen; cycle 3 cooling.	The above specimen; cycle 4 heating.	The above specimen; cycle 4 cooling,	
Sample Specifications	Same as above,	Same as above.	Same as above.	
Rept. Error %				
Temp. Range ^o l'	530	1264	514	
Ref.	54-27	54-27	54-27	
Sym	•	•	•	



NORMAL TOTAL EMITTANCE -- NICKEL + CHROMIUM + ΣX_1 (Incone) and Inconel X)

Sormal Total Emittance

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NORMAL TOTAL EMITTANCE -- NICKEL + CHROMIUM + Σx_1 (Incomel and Incomel X)

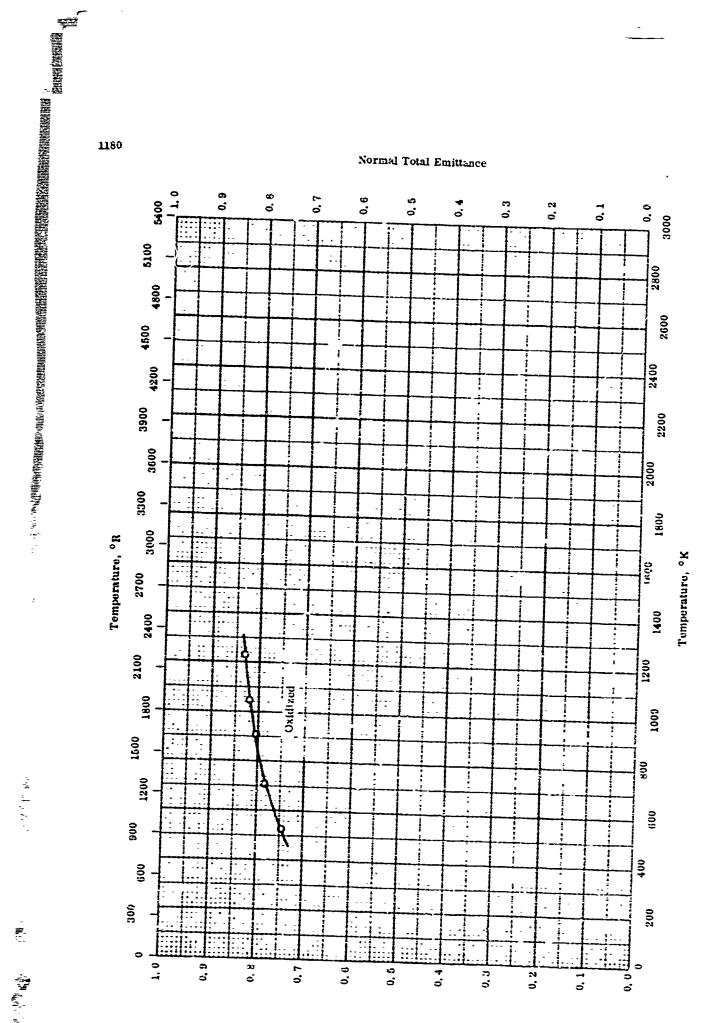
REFERENCE INFORMATION

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NORMAL TYPTAL EMITTANCE -- MCKEL + CHROMIUM + Σ_{1} (Continued) (Inconel and Inconel X)

		lng.				neas- e 1						
Remarks	The above specimen; cycle 2 cooling.	Scrubbed, washed, and wiped; measured in helium (10 microns pressure); cycle I heating.	The above specimen; eyele 1 cooling.	The above specimen; cycle 2 heating.	The above specimen; cycle 2 cooling.	Pollehed to a mirror like finish and washed: measured in helium (10 microns pressure); eyele 1 heating.	The above specimen; cycle 1 cooling.	The above specimen: cycle 2 heating.	The above spectmen; cycle 2 cooling.	The above specimen: cycle 3 heating.	The above specimen; eyele 3 cooling.	
	É	Sci	<u> </u>	Ę	<u>.</u> _	0 n 4	Ě	<u>.</u>	<u> </u>	Ē	<u>Ē</u> _	
Sample Specifications	Inconel X.	Inconel X.	Inconel X.	Inconel X.	Inconel X.	Inconel X.	Inconel X.	Inconel X.	Incomel X.	Incomet X.	Inconel X.	
Rept.												
Tomp. Range ok	514	72-1239	089	1139	514	40-1265	930	717.5	623	1166	222	
Ref.	54-27	74-27	6.4-27	54-27	64-27	54-27	5-1-27	54-27	5-1-27	54-27	54-27	
-												



NORMAL TOTAL EMITTANCE --- NICKEL + CHROMIUM + ΣX_1 (M 262)

Normal Total Emiliance

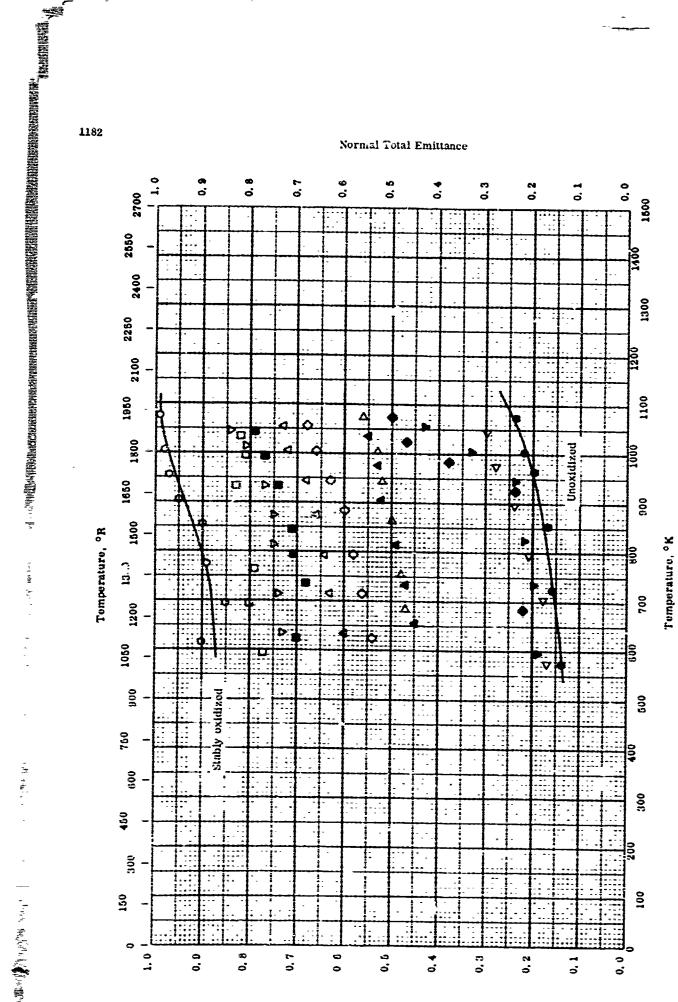
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Normal total emittance -- Nickel + Chromium + Σx_1 (m 252)

. ! _-

Remarks	Cheaned in 1 to 1 water-diluted HF solution for 1 hr; oxidizied 3 hrs at 1200 K in air; measured in decreasing temperatures.
Sumple Specifications	M 252; womfaul; 54.00 NI, 19.00 Cr, 10.00 Co, 10.00 ; io, 0, 10 C, 1.00 Mn, 0, 70 Si, 2, 60 Ti, 6, 75 Ai, 0, 10 C, 1.00 Mn, 0, 005 B, and 2, 00 F; surface roughness: fine atructure 2, 5 μ amplitude (as received), 2, 5 μ amplitude (fully aged).
Rept.	
Temp. Runge of	527-1239
Iko (,	0709
F1044	0



HORMAL TOTAL ENTITANCE -- NICKET, + CHRONIUM + EX. (Nimonia 76)

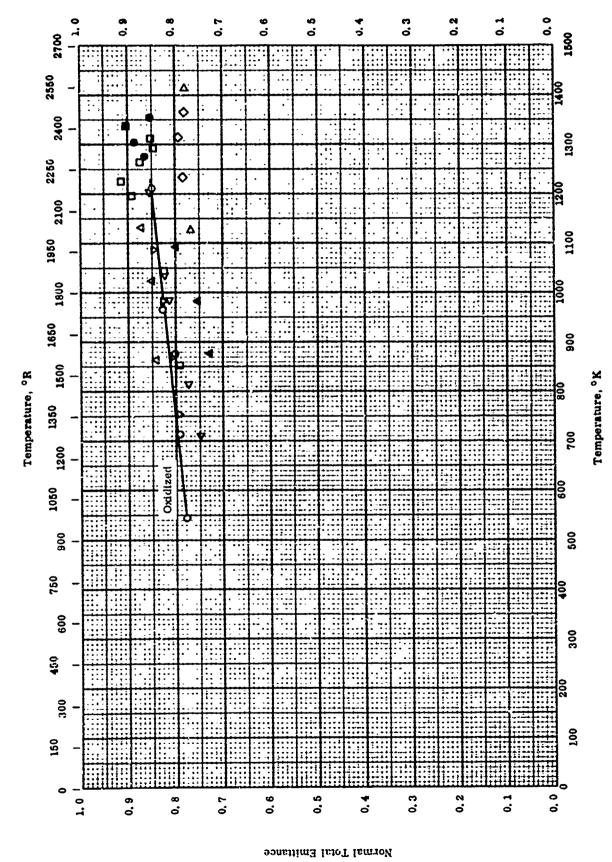
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NORMAL TOTAL EMITTANCE -- NICKEL $^+$ CHROMIUM $^+$ Σ $\times_{\rm I}$ (Nimonie 75)

E SE	ttert.	Temp. Range ok	Rept.	Sample Specifications	Петагкя
0	52-1N			Nimonic 75, nominal: 20 Cr. 5 Fe, 181, 1 Mn, 0, 4 Ti, und 0, 12 C.	Blastest, cleaned and exidized at 1473 K until a atendy state is reached; measured in air.
ם	52-18	603-1033		Same an above.	Sume an alwaye except existing a until a aleady state in reached.
<	02-18	633-1063		Вате вя вроуе.	Same no obove except exidized at 873 K until a steady wate is reached.
\(\)	62-18	025-1053		Rume as above.	Same an above; moxidized.
₽	02-18	633-1043		Nimonie 76.	Buffed, alwaned, and oxidizsi at 1473 K until v stendy state is reached; measured in air.
Δ	E	089-1073		Same as above.	Sumo an above except exidized at 1173 K until a stendy state in reached.
∇	52-18	673-1043		Вате вы вроуе.	Same an above except exhibited at 473 K until a atendy state in reached.
•	62-18	673-1073		Вате ин проус.	Unoxiditzat.
	81-29	023-1043		Nimonie 76.	As rolled, element, existing at 1473 K until a steady state is reached; measured in air.
4	81 -30	059±1033		Вате ен проме,	Oxidized at 1173 K until a stoady state is resched.
>	52-18	603-1083		Same an above.	Oxidized at 1873 K until a steady state is reached.
•	52-18	683-1073		Вате пл проус.	Unoxidized,
1				Hamilian 1647 in the Charles and the Charles of the	

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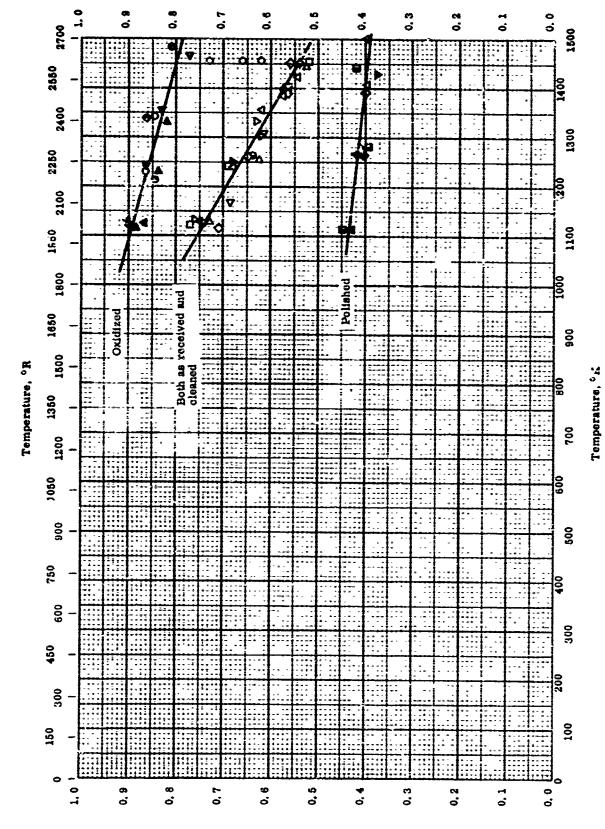
NORMAL TOTAL EMITTANCE \leftarrow NICKEL + CHROMUM + Σx_1 (Reng' 41)

NORMAL TOTAL EMITTANCE -- NICKEL + CHROMIUM + Σx_i (Reng' 41)

REFERENCE INFORMATION

Remarks	Cleaned in 1 to 1 water-diluted HF solution for 1 hr; oxidized 3 hrs at 1200 K in uir; measured in decreasing temperatures.	Same as the above specimen received from Boelng; measured in increasing temperatures; the specimen heated by gas for temperatures higher than 1227 6 33	The above specimen measured in descreasing temperatures,	Chromel-Alumel thermocouple mounted off center on the face; using gas fired stand.	The above specimen using electrically heated stand.	The above specimen using gas fired stand.	The above specimen using electrically heated stand.	The above specimen using gan fired stand.	The above specimen using gas heated stand, based on optical pyrometer,	Chromel-Alumel thermocouple mounted on the center of the surface; using electrically heated stand,
Sample Spacifications	Rene' 41; nominal: 19,00 Cr, 11,00 Co, 10,00 Mo, 3,10 Tl, 1,50 Al, 0,09 C, and 0,065 B; surface roughness: (fully aged) fine structure 2 microns high, coarse structure 5 microns high at 200 microns intervals.	Same as the above specimen.	Some as above.	Rene 41 from Bocing Afreraft Co. [Author's design.: Sample No. 1].	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Rene' 41 from Boeing Aircraft Co. [Author's design.: Sample No. 2].
Rept. Error%			·							•
Temp. Range ok	544-1211	855-1311	864-1131	1233-1366	755-1089	1128-1416	711-1205	1278-1355	1339	755-1094
Ref.	60-20	60-20	60-20	62-22	62-22	62-23	62-22	62-22	62-22	62-22
Sym	0	٥	٥	♦	D	Δ	▽	•		4

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NORMAL SPECTRAL LMITTANCE -- NICKEL + CHROMIUM + ΣX_1 (Income! X)

Normal Spectral Emittance

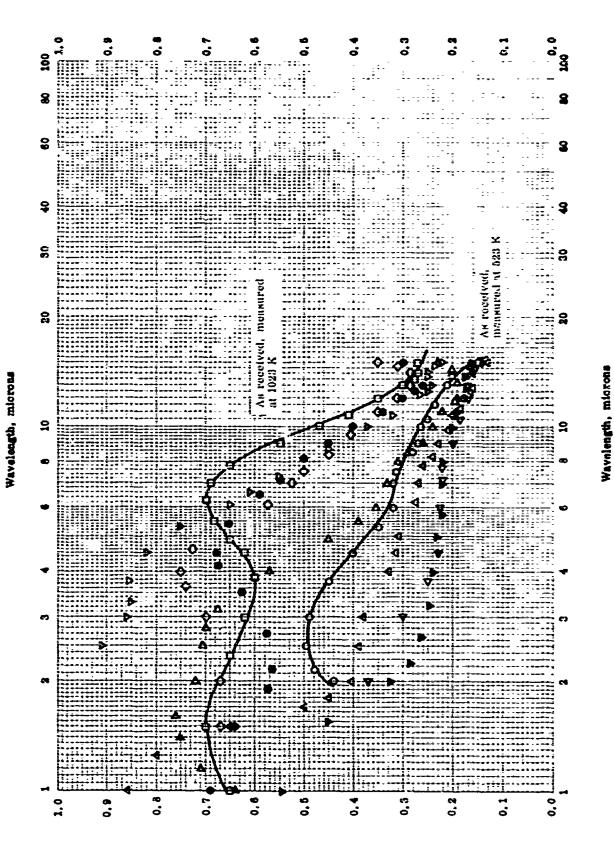
NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + ΣX_{\parallel} (Income X)

Sym bol	Ref.	Wavelength	Temp _b Range, ^b K	Rept. Error%	Sample Specifications	Romarks
0	57-48	0, 665	1122-1460	01#	Inconel X, nominal; 73 Ni, 16 Cr. 7 Fe, 2.6 Ti, 1 Nb, and 0.9 Al.	As received; measured in vacuum (5×10 ⁻⁴ mm lig); tirst cyclo heating.
٥	57-48	0, 665	1128-1422	∓10	Samo as abovo.	Same as above; first eyele cooling.
0	57-48	0, 665	1122-1453	# 10	Samo as abovo.	Same as above; second eyele heating.
D	57-48	0, 665	1133-1333	± 10	Same as above,	Same as above; second eyele cooling.
\lambda	57-48	0, 665	1116-1450	#10	Sume an above,	Cionned with a liquid detergent; measured in vacuum (6x 10"4 mm lig); first cycle
						heating.
∇	57-48	0, 665	1167-1308	# 10	Same as above.	Same as above; first eyele cooling.
۵	57-48	0, 665	1128-1444	± 10	Same as above.	Same as above; second eyele heatin;
•	57-48	0, 665	1125-1264	± 10	Same as alxove.	Same as above; second eyele cooling
4	57-48	0,665	1114-1500	# 10	Same as alxove.	Polished with fine polishing compound on a buffing wheel: measured in vacuum
						(5x 10"4 mm Hg); first eyele heating.
•	67-48	0, 665	1114-1440	# 10	Same as above.	Same as above; first eyele cooling.
>	67-48	0, 065	1280-1610	± 10	Same as above.	Same as above; second eyele hearing.
•	57-48	0, 665	1264-1391	07 ∓	Запе вы зроус.	Same as above; second eyele cooling.
V	67-48	0, 665	1128-1460	# 10	Same as above.	Oxidized in air at red heat for 36 min;
					(Continued onto next page)	first cycle heating.

NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + EX_j (continued) (Income! X)

A CONTRACTOR OF THE PROPERTY O

Remarks	Same as above; first eye's cooling.	Same as abover secenc ^e cycle heating.	Same us above; second eyele cooling.						
Sample Specifications	Sume as above,	Same as above.	Same as above.						
Rept Error%	4 10	# 10	0T Ŧ						
Temp.	1116-1330	1214-1483	1126						
Wavelength	0, 665	0, 665	0, 665						
Rof.	57-48	57-48	5718					 	
E SYEE	Δ	•	4	, 				 	 ٦



NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + EX₁
(Hintelloy X)

Sormal Spectral Emittance

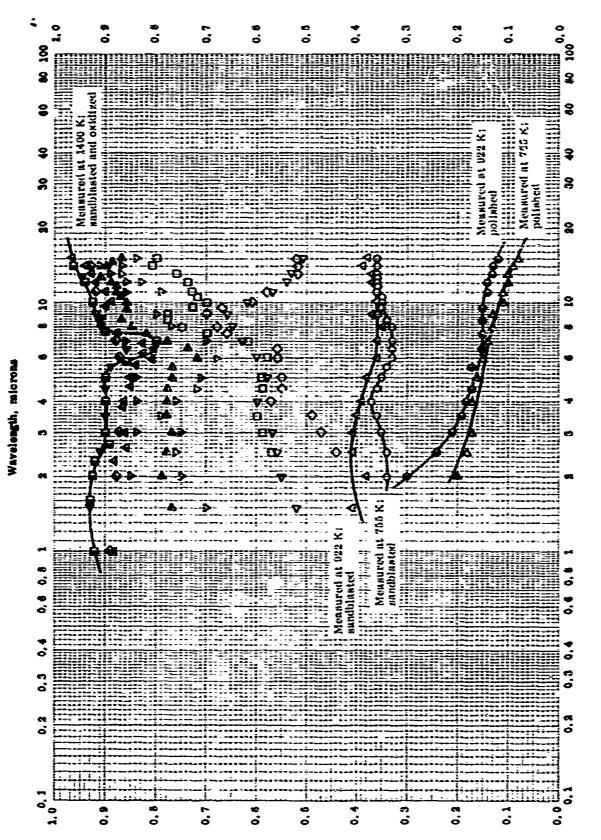
NORMAL SPECTIVAL EMITTANCE -- NICKEL + CHROMIUM + Σx_1 (Habtelloy X)

The state of the s

Remarks	An rucaived.	An received.	As received,	Reated in urgon at 2000 F for 1/2 br.	Bented in argon at 2000 F for 1/2 hr.	Heated in argon at 2000 F for 1/2 hr.	Heatest in a vacuum of 2, 6 x 10" t mm Hg at 2000 F for 3/2 hr.	Heated in a vacuum of 2, 5 x 10" 4 mm ¹¹ R at 2000 F for 1/2 hr.	Reuted in a vacuum of 2, 6 × 10 ⁻⁴ mm lig at 2000 F for 1/2 hr.	
Sample Specifications	Hastelloy X1 nominal: 57.8 - 49,4 Ni, 20,6 - 23 Cr, 17 - 20 Fe, 2 - 10 Mo, 1 Mn, 1 Ei, 0,5 - 2,5 Co, 0,2 - 1 W, and 0,05 - 0,15 C; AMS 5530 C.	State as above.	Saine no above.	Same na above.	Same an above.	Same as abovo.	Same as above.	Вате ин аколе.	Same as above.	
Rept.		-								
Wavelength Range, µ		1, 00-16, 00	1, 00-15,00	3, 00-15, 00	1, 00-15, 00	1, 00-15, 00	2, 00- 15, 00	1,00.16,00	1, 00-15, 60	
Temp, ^o K	2,625	773.2	1023	623,2	773.0	1023	31 51 52 52	773.2	1002	
Rof.	62-19	62-10	62-10	01 - 29	62-19	62-10	6229	62-10	01-29	
Byn Tod	0	٥	D	D	•	\(\)	▽	>	Δ	



Normal Spectral Emittance



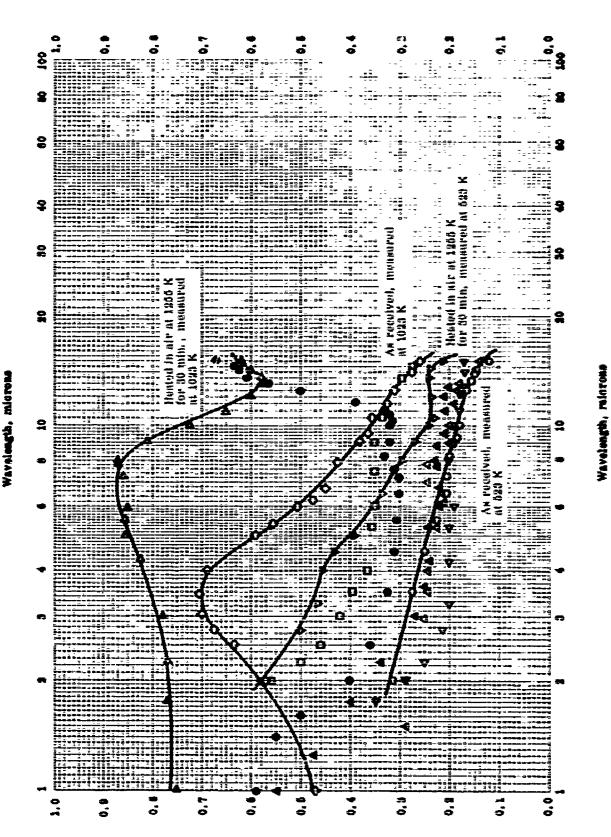
Wavelength, microne

NORMAL SPECTRAL, EMPTANCE -- NICKEL + CHROMIUM + EX. (Incomal)

A CALL CONTROL OF THE CALL

NORMAL SPECTRAL EMITTANCE -- ETCKEL + CHROMIUM + EM (Inconc.)

17.7	Ref.	N o 'dwoJ,	Wavelength Runge, µ	Rept	Sample Spacifications	Nemarka
0	07-09	755	91-2	3 0	Inco	Sandbasted,
G	81:-18	880	1, 5-10	*	monn!	game an above.
0	97-09	756	2. 6-15	æ ≎	(neonat,	Sleatropolfshed, exidized in air at 1266 K for 110 min.
Þ	97-10	1266	1. 6-16	æ	Inconel.	Bame as above.
٥	55-16	100	2, 0-16	*	liuomet.	Emilylasted, oxidized in air at 1266 K for 110 min.
⊽	01-62	3383	7. 5-16	3 0	Inconel.	Same as above.
Δ	07-09	750	2-10	æ	Incomet.	Electropolished.
•	20-10	220	3***	æ	Inconet.	Same as above.
4	97-09	7000	1-16		Incared.	Sandblasted, oxidized t. atr at 1966 K for 2 brat measured in air.
₽	91-00	1400	116	z :	Ingone1,	Bume as above.
>	91-49	873	7	-	Incoret	Uttrasouleally muchinal, exidized in utr m 873 K; measured in utr.
•	90-10	1273	1-14	7 =	Incomt	Utranonically muchined, exidized in air at 1273 K; measured in air.
v	60-10	1400	1, 6-16	=	Incount.	Saidblinked, oxidized in alr at bign tempera- ture to form in opaque oxide gooting.
4	01::00	780	1, 5-16	1)	Incarel,	પ્રવાપલ લક્ષ લોહાપલ,

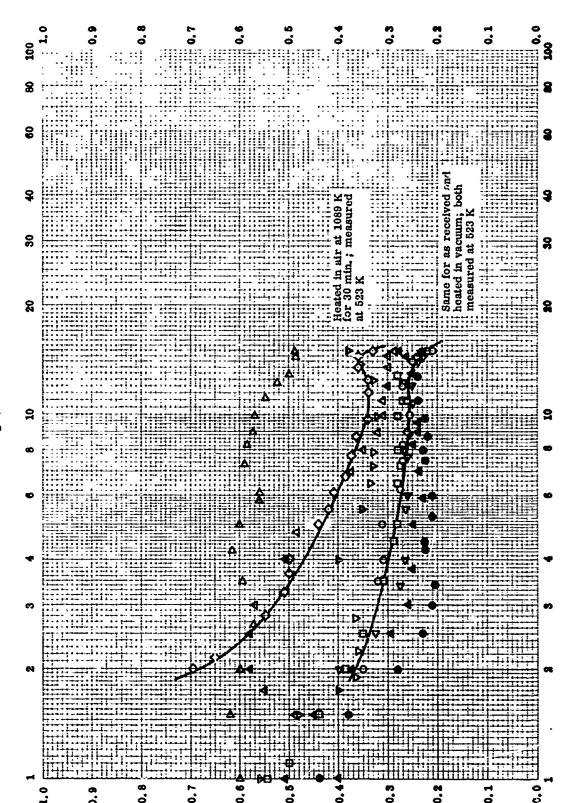


Nounal spectral emittance ... Nickel + Chiconon + Ex. (Incomo 702)

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NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + Σx_i (inconel 702)

		_								
Remarks	As received.	As received.	As received.	Heated in air at 1255 K for 30 min.	Heated in air at 1255 K for 30 min.	Heated in air at 1255 K for 30 min.	Heated in air 7.6 \times 10 ⁻⁵ mm Hg vacuum at 1255 K for 30 min.	Same treatment as above.	Same treatment as above.	
Sample Specifications	Commercial Inconel 702; nominal: 74.4 Ni, 17 Cr. 3.75 Al, £ Fe, 1 Mn, 0.7 Si, 1 Ti, and 0.1 C.	Commercial Inconel 702	Commercial Inconel 702,	Commercial Inconel 702.	Commercial Inconel 702,	Commercial Inconel 702.	Commercial Inconel 702.	Commercial Inconel 702.	Commercial Inconel 702.	
Rapt. %										
Wavelength Range, p	2,00-15.00	1,50-15,0	1,00-15.00	2.00-15.00	1, 00-15, 00	1,00-15,00	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	
Temp. ^o K	523.2	773.2	1023	523.2	773.2	1023	523.2	773.2	1023	
Ref.	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19	
11 July 12 Jul	0	٥	¢	D	•	Δ	L	∇	4	



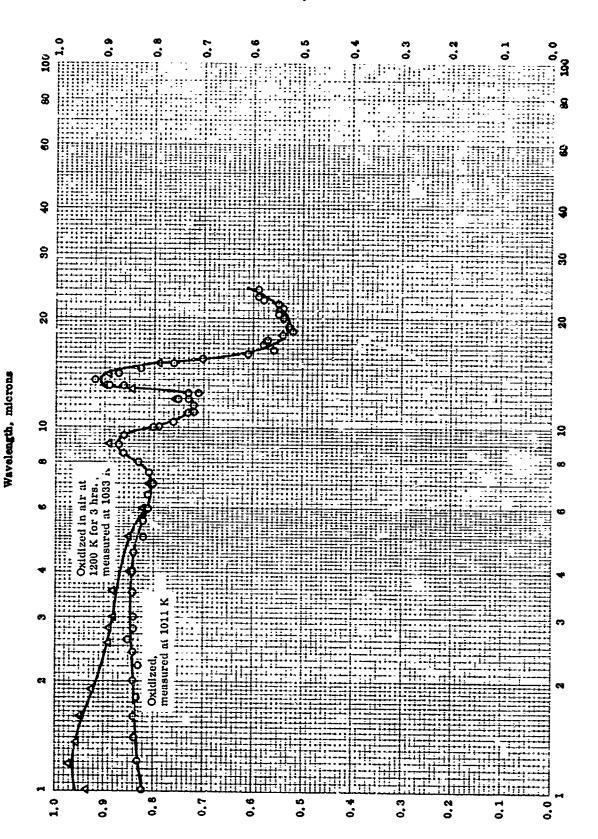
NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + Σx_1 (Income) X)

Wavelength, miorons

Normal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + Σx_1 (Inconel X)

Remarks	As received.	As received.	As received.	Heated in air at 1089 K for 30 min.	Heated in air at 1089 K for 30 min.	Heated in air at 1089 K for 30 min.	Heated in a 6.8 x 10 ⁻⁵ mm Hg vacuum at 1089 K for 30 min.	Sam treatment as the above specimen.	Same treatment as the above specimen.	
Sample Specifications	Inconel X; nominal: 72,9 Ni, 15 Cr, 7 Fe, 2.5 Fi, 1 Nb, 0.7 Al, 0.5 Mn, 0.4 Si, and 0.04 C; AMS5542.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Rept.						-				
Wavelength Range, u	2, 00-15, 00	1,00-15,00	1, 00-15, 00	2,00-15,00	1.00-15.00	1.00-15.00	2,00-15,00	1, 00-15, 00	1,00-15,00	
Temp. °K	523.2	773.2	1023	623, 2	773.2	1023	523.2	773.2	1023	
Rof.	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19	
37.18 20.18	0	0	٥	\$	٥	Δ	▽	•	4	



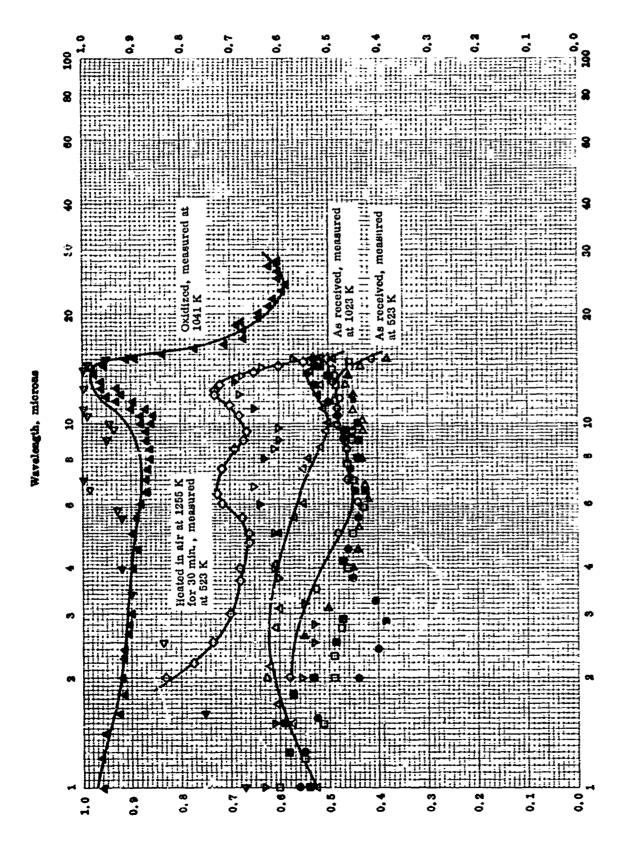
NCRMAL SPECTRAL EMITTANCE -- N.TKEL + CHROMIUM + Σx_i (M 252)

Normal Spectral Emittance

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Normal spectral emittance -- r_1 . . + chromium + Σx_1 (m. 252)

Remarks	Well oxidized.	Cleaned in 1 to 1 water-diluted HF solution for 1 hr; oxidized 3 hrs at 1200 K in air.			
Sample Specifications	M 252; nominal: 54.00 Mi, 19.00 Cr, 10.00 Co, 10.00 Mo, 0.10 C, 1.00 Mn, 0.70 Si, 2.50 Ti, 0.75 Al, 0.10 C, 1.00 Mn, 0.005 B, and 2.00 F.	M 252; surface roughness: fine structure 2.5 μ amplitude. Cleaned in 1 to 1 water-diluted. HF solution for 1 hr; exidized 3 hrs at 1200 K in air.			
Rept. Error					
Wavelength Range, μ	1,00-24.00	1, 00-15, 00			
Temp. °K	1010.9	1033.2		 	
Ref.	62-22	60-20			
100 200 200	0	٥			



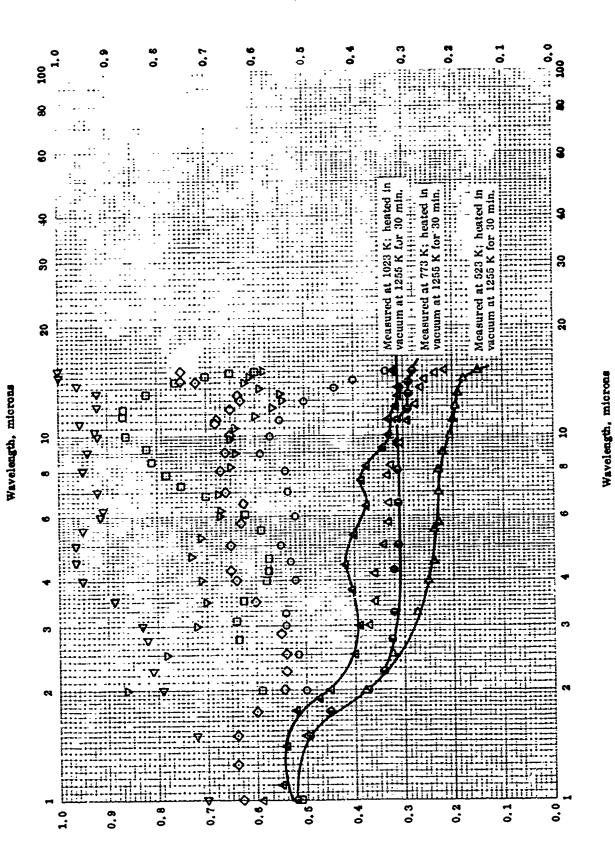
NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + 5X1 (Rene' 41)

Normal Spectral Emittance

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NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + Σx_1 (Rene' 41)

Remarks	As received.	As received.	As received.	Heated in air at 1255 K for 30 min.	Heated in air at 1255 K for 30 min.	Heated in air at 1255 K for 30 min.	Heated in a 7.6 x 10 ⁻⁵ mm Hg vacuum at 1255 K for 30 min.	Same treatment as above.	Same treatment as above,	Well oxidized.	
Sample Specifications	Commercial Rene 41; nominal: 65.4 Ni, 19 Cr. 11 Co. 10 Mo, 3 Ti, 1.5 Al, 0.09 C, and 0.005 B.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Rene ' 41,	
Rept. Error %										·	
Wavelength Range, L	2.00-15.00	1,00-15,00	1.00-15.00	2.00-15.00	1.00-1-00	1.00-15.00	2,00-15,00	1.00-15.00	1, 00-15, 00	1, 00-24, 00	
Temp. °K	523.2	773.2	1023	523.2	773,2	1023	523.2	773.2	1023	1041.5	
Ref.	62-19	62-10	62-19	62-19	62-10	62-19	62-19	62-19	62-10	62-22	
₽ 2 6 2	0	0	٥	\lambda	D	∇	Δ	•		4	

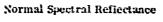


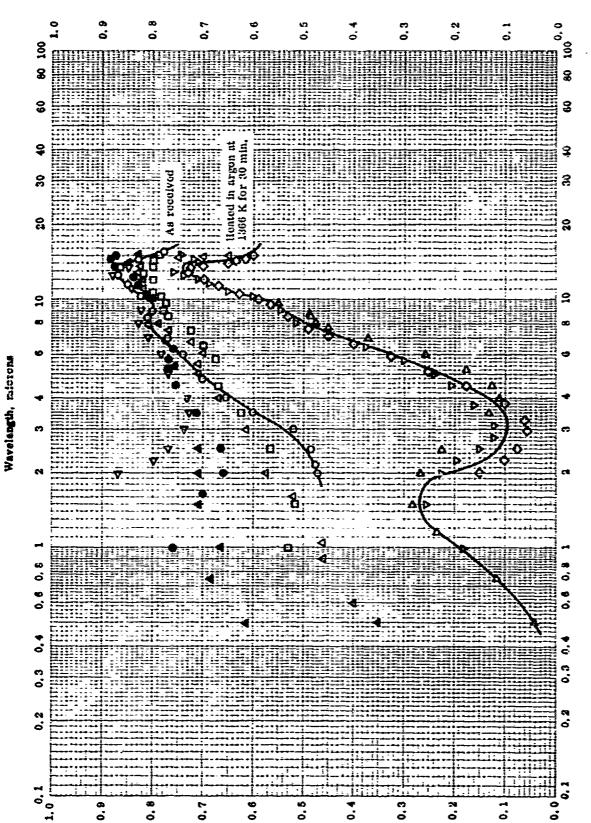
NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + EX; (Udimet 500)

Sormal Spectral Emittance

NORMAL SPECTRAL EMITTANCE -- NICKEL + CHROMIUM + EX. (Udimet 500)

			-							·	
Remarks	As received.	Same as above, different specimen.	Same as above, different specimen.	Heated in air at 1265 K for 30 min.	Same as above, different specimen.	Same as above, different specimen.	Heated in a 7, 6 x 10 ⁻⁵ vacuum at 1255 K for 30 min.	Same as above, different specimen.	Same as above, different specimen.		
Sample Spenifications	Commercial Udimet 500; 44.1 Ni, 20 Cr, 20 Co, 5 Mo, 4 Fe, 3, 25 Ti, 2, 5 Al, 0, 75 Mn, 0, 75 Si, 0, 15 C, and 0, 01 B.	Same as above.	Sume no above.	Commeret 11 12 met 500.	Same as above.	Same as above.	Commercial Udimet 500.	Same as above.	Same as above.		
Ropt.											
Wavelength Range, µ	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	2, 00-15, 00	1, 90-15, 90	1, 00-15, 00		
Temp. °K	623	773	1023	523	773	1023	523	173	1023		
Ref.	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19		
a loc	0	٥	0	>	Ÿ	▽	Δ	۵	4		





Wavelength, microns

NORMAL SPECTRAL REFLECTANCE -- NICKEL + CHROMIUM + ΣX_i (Hastelloy X)

TPRC

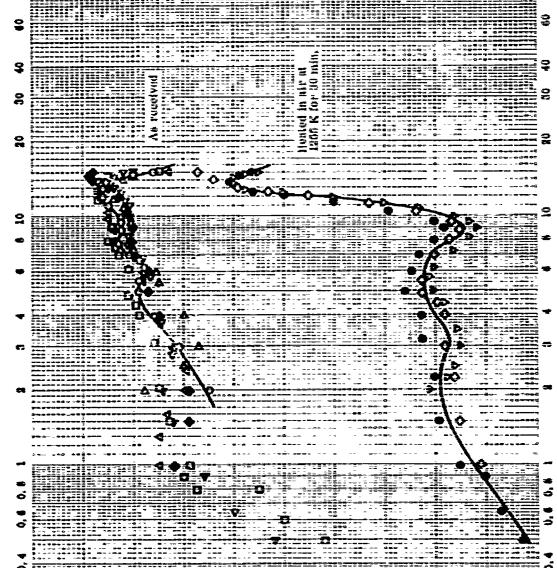
Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- NICKEL + CHROMAUM + EN (Highellog X)

Homarks	As received; 523, 2 K source,	The above specimen with 773,2 K source.	The above specimen with 1273 K sources.		The above specimen with 773.2 K source.	The above specimen with 1279 K source.	Heuted in a vacuum of 2, 5 x 10"4 mm lig at 1364 K for 30 min, ; 523, 2 K source.	The above specimen with 779, 2 K source,	The above spectmen with 1273 K source.	
Sample Specifications	Hastelloy X: nominal: 67,8 NI, 20,5 Cr. 17 Fe, 2 Mo, 1 Mn, 1 Si, 0,5 Co, 0,2 W and 0,05 C; AMS 5530 C.	Same as abova.	Same ия проме.	Hustelloy X: sume as alzee.	Sume as above.	Sume an above,	Unstelloy XI same no above,	Same na above.	Same as alaye,	
Rept. %										
Wavelength Vange,	2,00-15,5	1,00-15,00	0. 50-15, 00	2, 90-15, 00	1.00-15.00	0. 50-15, 00	2, 00-15, 00	1,00-15,00	00'90-19'00	
Temp, ⁹ K	88.0 v		11 12 12 12 12 12 12 12 12 12 12 12 12 1	## P	27.0 ×			*	53	
Røf.	91-39	61-29	01-29	91-29	01-20	3-20	03-10	2 - 20	2 .50	
Bym Isol	0	0	4	\$	Þ	Δ	V	•	4	







Normal Spectral Reflectance

Wavelength, mlorona

NORMAL REPUBLICATION (RECTANCE --- NICKEL -- CHROMIUM + EX)

1145

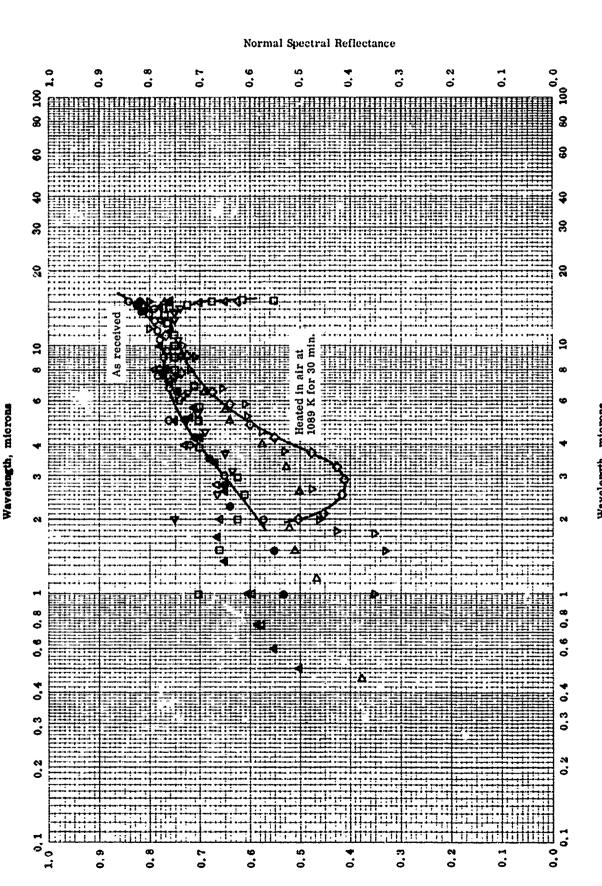
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NORMAL SPECTRAL REFLECTANCE --- MCKEL + CHROMIUM + $\Sigma x_{\rm i}$ (Inconel 702)

Remarks	As received; 523,2 K source.	The above specimen with 773, 2 K source.	The above specimen with 1273.2 K source.	Heated in air at 1255 K for 30 min.; 523, 2 K source.	The above specimen with 773, 2 K source.	The above specimen with 1273.2 K source.	Heated in a 7.6 x 10 ⁻⁵ mm Hg vacuum at 1255 K for 30 min.; 523.2 K source.	The above specimen with 773, 2 K source.	The above specimen with 1273.2 K source.	
Sample Specifications	Commercial Inconel 702; nominal: 74.4 Ni, 17 Cr, 3.75 Al, 2 Fe, 1 Mn, 1 TN, 0.7 Si and 0.1 C.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Zame as above.	Same as above.	
Rept. %										
Wavelength fla.v.e, h	2.00-15.00	1,00-15,00	0.50-15.00	2,00-15,00	1.00-15.00	0.50-15.00	2.00-15.00	1,00-15,00	0,50-15,00	
Temp. °K	< 322	< 322	< 322	< 322	< 322	< 322	< 322	< 322	< 322	
Ref.	62-19	62-19	62-19	62-19	62-19	62-19	62-19	65-19	62-19	
Sym	0	4	۵	D	\$	•	Δ	•	▽	





NORMAL SPECTRAL REFLECTANCE --- NICKEL + CHROMIUM + Σx_1 (Inconel X)

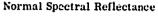
Normal Spectral Reflectance

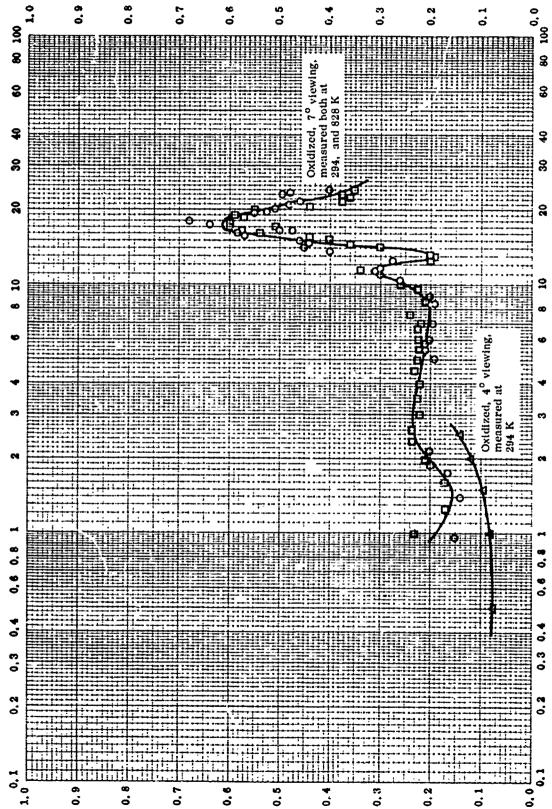
TPRC

NORMAL 3PECTRAL REFLECTANCE -- NICKEL + CHROMIUM + Σx_i (Incomel X)

Remarks	As received; 52.3, 2 K source.	The above specimen with 773, 2 K source.	The above specimen with 1273, 2 K source.	Heated in air at 1089 K for 30 min.; 523.2 K source.	The above specimen with 773, 2 K source.	The above specimen with 1273, 2 K source.	Heated in a 6.8 x 10^{-6} mm Hg vacuum for 30 min, at 1089 K; 523, 2 K source.	The above specimen with 773,2 K source.	The above specimen with 1273, 2 K source.	
Sample Specifications	Inconel X; nominal: 72,9 Ni, 15 Cr, 7 Fe, 2,5 Ti, 1 Nb, 0.7 Al, 0.4 Si, 0.04 C and 0.5 Mn; AMS 5542.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Rept. Error %										
Wavelength Range, μ	2,00-15,00	1,00-15.00	0, 50-15, 00	2.00-15.00	1,00-15,00	0,455-15,00	2,00-15,00	1.00-15.00	0.00-15.00	
Temp. ^o K	< 322	< 322	< 322	< 322	< 322	< 322	< 322	< 322	< 322	
Rof.	62-19	62-19	62-19	62-19	62-19	62-10	62-19	62-19	62-19	
Sym bol	٥	0	٥	♦	Þ	Δ	V	•	4	







Wavelength, microns

Avelenath, microns

NORMAL SPECTRAL REFLECTANCE -- NICKEL + CHROMIUM + Σx_1 (M 252)

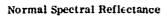
Normal Spectral Reflectance

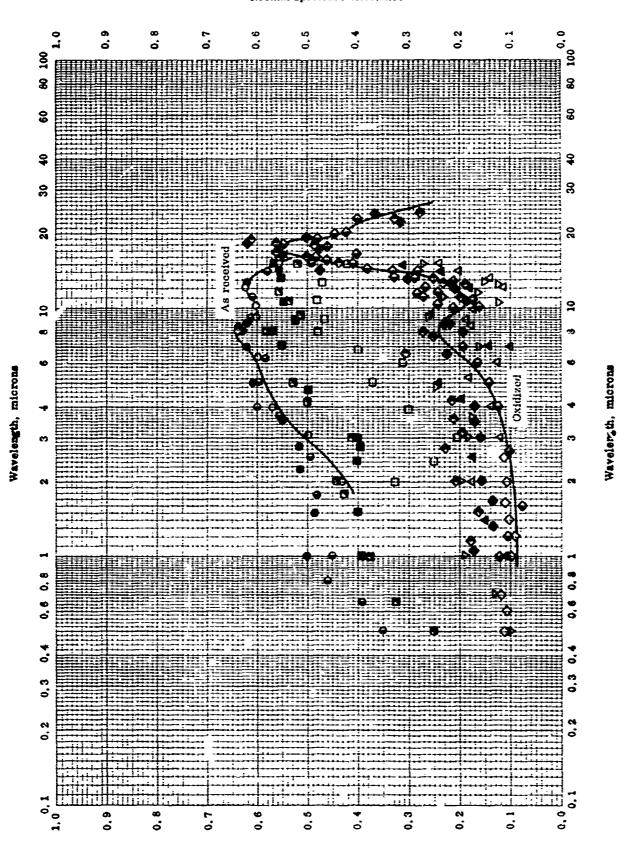
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NORMAL SPECTRAL REFLECTANCE -- NICKEL + CHROMIUM + ΣX_{j} (M 252)

Remarks	Cleaned in 1 to 1 water-diluted HF solution for 1 hr; oxidized 3 hrs. at 1200 K in air; hemispherical illumination and 7° viewing.	The above specimen measured at 827, 6 K.	Cleaned in 1 to 1 water-diluted HF solution for 1 hr.; oxidized at 1200 F for 3 hrs. in air; hemispherical illumination and 4° viewing.
Sample Specifications	M 252; nominal: 54,00 Ni, 19,00 Cr, 10,00 Co, 10,00 Mo, 0,10 C, 1,00 Mn, 0,005 B and 2,00 F; surface roughness: 2.5 μ amplitude.	Same as above.	M 252; surface roughness: 2,5 µamplitude.
Rept. Error %			
Wavelength Range, μ	0.97-24.0	1.0 -24.0	0.5 - 2.5
Temp. ^o K	294.3	827.6	294.3
Ref.	60-20	60-20	60-20
m jou	0	0	4







NORMAL SPECTRAL REFLECTANCE -- NICKEL + CHROMIUM + EX₁ (Rone' 41)

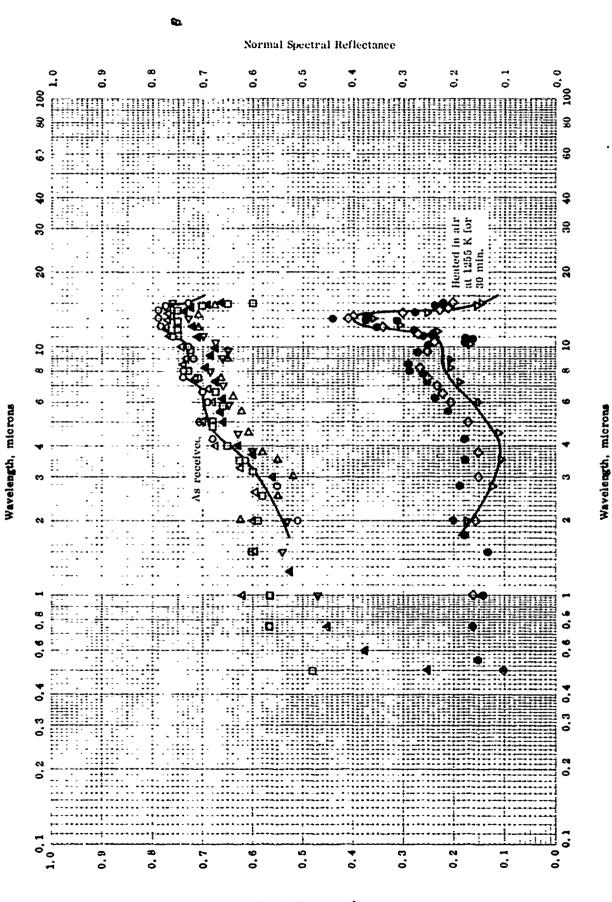
Normal Spectral Reflectance

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NORMAL SPECTRAL REFLECTANCE -- NICKEL + CHROMIUM + $\Sigma N_{\rm I}$ (Rene* 41)

Sym	Ref.	Temp. ² F	Wavelength Range, µ	Rept.	Sample Specifications	Remarks
0	61 - 29	888 -	2, 00-15, 00		Commercial Rene 41; nominal: 55,4 Ni, 19 Cr, 11 Co, 10 Mo, 3 Ti, 1,5 Al, 0,09 C and 0,005 B,	As received; 523,2 K source.
•	62-19	322	1, 00-25, 00		Same as aboze,	The above specimen with 773, 2 K source.
•	62-19	. 322	0, 50-15, 00		Same as abovo.	The above specimen with 1273 K source.
4	65-19	61 62 63 70 7	2, 00-15, 00		Same as above.	Heated in air at 1255 K for 30 min.; 523, 2 K source.
4	62-19	, 322	1, 00-15, 00		Same as above.	The above specimen with 773, 2 K source.
D	62-19	222	0, 50-15, 00		Same as above.	The above specimen with 1273 K source.
0	62-19	27 27 27 27 27	2, 00-15, 00		Same an above.	Heated in a 7, 6 × 10 ⁻⁵ mm llg vacuum at 1255 K for 30 min.; 523, 2 K source.
	61-29	122	1, 00-15, 00		Same as above.	The above specimen with 77:1, 2 K source.
3	62-19	182	0, 50-15, 00		Sume as above.	The above specimen with 1273 K source.
¢.	60-20	294.3	0, 5 -2, 50		Rene' 41(SSSOSO); surface roughness: fine structure 2 u high, coarse structure 5 µ at 200 µ intervals.	Cleuned in 1 to 1 water-diluated HF solution for 1 hr and oxidized 3 hrs at 1200 K in air; 4° illumination and hemispherical viewing.
•	00-20	58 7	1,05-24,0		Rene' 41(SS8080); surface roughness: fine structure 2 μ high, coarse structure 5 μ at 200 μ intervals.	Cleaned in 1 to 1 water-diluted HF solution for 1 hr and oxidized 3 hrs at 1200 K in air; hemispherical illumination and 7° viewing.
¢	60-20	828. 1	1, 15-24,0		Same as above,	The above specimen measured at \$28, 1 K.
÷	62-22	294, 3	1, 00-23, 00		Same as above,	Well oxidized, hemispherical illumination and 7° viewing,





NORMAL SPECTRAL REFLECTANCE -- NICKEL + CHROMIUM + Σx_i (Udimet 500)

Normal Spectral Reflectance

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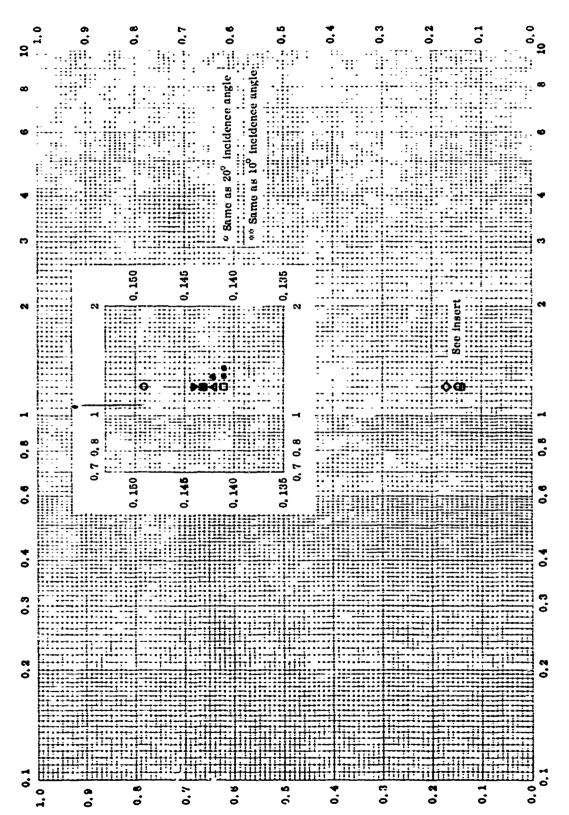
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NORMAL SPECTRAL REFLECTANCE ... NICKEL + CHROMIUM + Σx_1 (Udimet 500)

Remarks	Ан received; 523.2 К nource.	The above specimen with 773, 2 K source.	The above specimen with 1273 K source.	Heated in air at 1255 K for 30 min.; 523, 2 K source.	The above specimen with 773, 2 K source.	The above specimen with 1273, 2 K source.	Heuted in a 7,6 x 10 ⁻⁵ vacuum at 1255 K for 30 min.; 523, 2 K source.	The above specimen with 773, 2 K source.	The ubove specimen with 1273 K source.	
Sample Specifications	Commercial Udimet 500, nominal: 44.1 Ni, 20 Cr, 20 Co. An received; 523.2 K source. 5 Mo, 4 Fe, 3,25 Ti, 2.5 Ai, 0.75 Mn, 0.75 Si, 0.15 C. and 0.01 B.	Same as above.	Same as above.	Commercial Udimet 500.	Same as above.	Same ан above.	Commercial Udimet 500,	Same as above.	Same as above.	
Rept. Error %										
Wavelength Itange, µ	2,00-15,00	1.00-15.00	0, 50-15, 00	2.00-15.00	1,00-15,00	0, 80-16, 00	2,00-15,00	1,00-15,00	0, 5015, 00	
Temp, °K	× 322	< 322	< 322	< 322	< 322	< 322	< 322 < 322	< 322	25 C Y	
Ref.	62-19	62-19	62-19	62-19	62-19	62-18	67-19	65-19	62-19	
55 m	Q	<1	0	D	\(\rightarrow \)	•	Δ	▽	4	

Angular spectral reflectance -- nickel + chromium + DX₁ (*m* 252)

Wavelength, miorons



Angular Spectral Reflectance

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ANGULAR SPECTRAL REFLECTANCE -- NICKEL + CHROMIUM + EN₁ (M 262)

£ 2	0	0	4	4	D	•		♦
Ref.	60~20	07-09	02-09	62-09	60-20	07-09	98-39	02-09
Temp. oK	208	20x	*	¥6	*02	208 -	æ a z	202
Wavelength fange, µ	1.2	2.1		.: ::	 	2.2	1,2	N
Rept.								
Sample Specifications	M 252; nominal: 54,00 Ni, 19,00 Cr, 10,00 Co, 10,00 No, 0, 10 C, 1,00 Mn, 0,005 B, and 2,00 F; surface roughness: 3,5 \mu unpittude.	Same an above.	Santo na above.	Sume as alwee.	Same an alwee.	Same an above.	Same an abye.	Same as above,
Remarks	Cleaned in 1 to 1 water-diluted life solution for 1 hr; oxidized at 1200 F for 3 hrs in air; with MgO as reference; normal illumination and hemispherical viewing.	The above specimen; 10° illumination and bemispherical viewing.	The above speciment 20° illumination and hemispherical viewing.	The above specimen: 30° illumination and hemispherical viewing.	The obove specimen: 40^o Mumination and hemispherical viewing.	The above specimen; $\delta \theta^{\prime}$ illumination and hemispherical viewing,	The above aprotimen: 60° illumination and hemispherical viowing.	The above specimen; TP Mumination and homispherical viewing.

PROPERTIES OF NICKEL + COBALT + ΣX_i

REPORTED VALUES

Density: See figure

Melting Point: K R

O Nimmir 100 1615 ± 35 2512 ± 63

TPRC

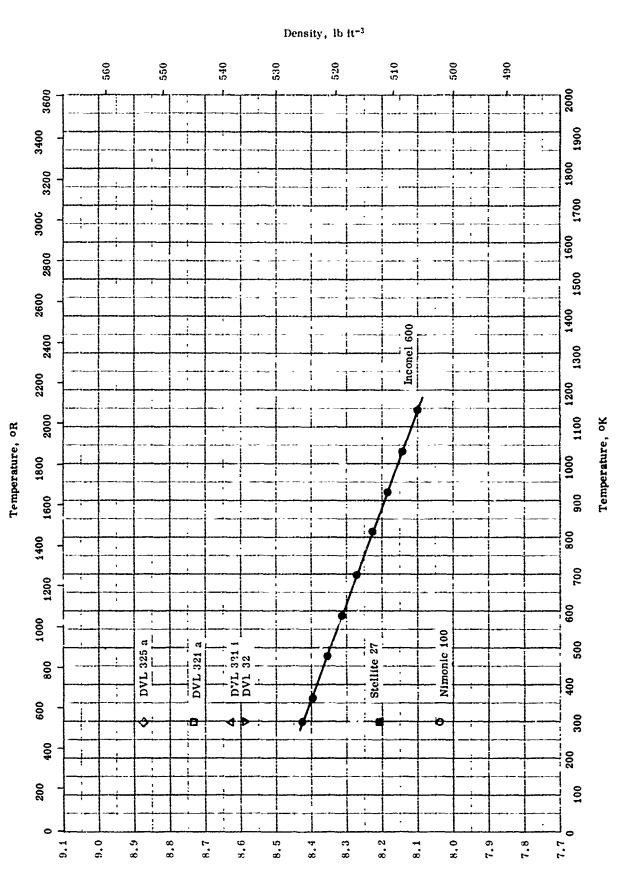
PPOPERTIES OF NICKEL +COBALT + $\Sigma X_{\hat{I}}$

Remarks	
Sample Specifications	Nimonic 100; 18-22 Co, 10-12 Cr, 4.5-5.5 Mo, 4-6 Al, 2>Fe, 1-2 Ti, 0.5 'Si, and 0.3 'C.
Rept. Error	
Temp. Range ok	1583-1653
Ret.	56-37
Sy.m.	0



DENSITY -- NICKEL +COBALT + EX

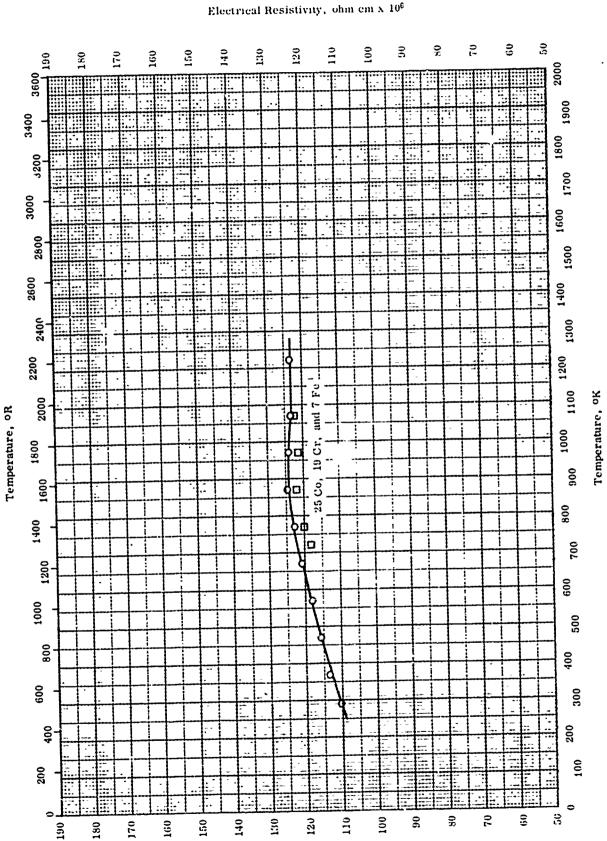
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Density, g cm-3

DENSITY -- NICKEL +COBALT + 5X1

Remarks							
Sample Specifications	Nimonic 100; 18-22 Co, 10-12 Cr, 4.5-5.5 Mo, 4.6 Al, 2>Fe, 1-2 Ti, 0.5 > Si, and 0.30 > C.	DVL 321 a (German Design.); 34.1 Ni, 25.4 Co, 14.6 Cr, 13.8 Fe, 5.0 Mo, 4.75 W, 1.3 Ta, 0.54 Mn, 0.45 Si and 0.04 C.	DVL 321 I (German Design.); 34.2 Ni, 25.5 Co, 14.8 Cr, 13.7 Fe, 5.2 Mo, 4.5 W, 1.08 Ti, 0.62 Mn, 0.40 Si, and 0.04 C.	DVL 325 a (German Design.); 34.3 Ni, 25.1 Co, 14.9 Cr, 4.9 Mo, 4.88 Ta, 4.54 W, 0.53 Mn, 0.49 Si, and 0.04 C.	DVL 32 (German Design.);35.2 Ni 24.5 Co, 15.4 Fe, 14.6 Cr, 4.7 W, 4.46 Mo, 0.71 Mn, 0.44 Si, and 0.03 C.	Haynes Stellite Aloy No. 27; 30.0 min Co, 23.0 -29.0 Cr, 5.0 - 7.0 Mo, 2.0 mix Fe, and 0.35-0.50 C.	Inconel 600; 73,55 Ni +Co, 16 Cr, 7,55 Fe, 2,30 Np + Ta, 0,3 Si, 0,2 Mn, 0,04 C, 0,03 Cu, and 0,005 S.
Rept.							
Temp. Range ok	298	293	293	293	293	298	300-1145
Ref.	56-37	47-3	47-3	47-3	47-3	50-3	62-7
Sym	0	0	◁	\lambda	D		•



ELECTRICAL RESISTIVITY ... NICKEL + COBALT + Σx_i

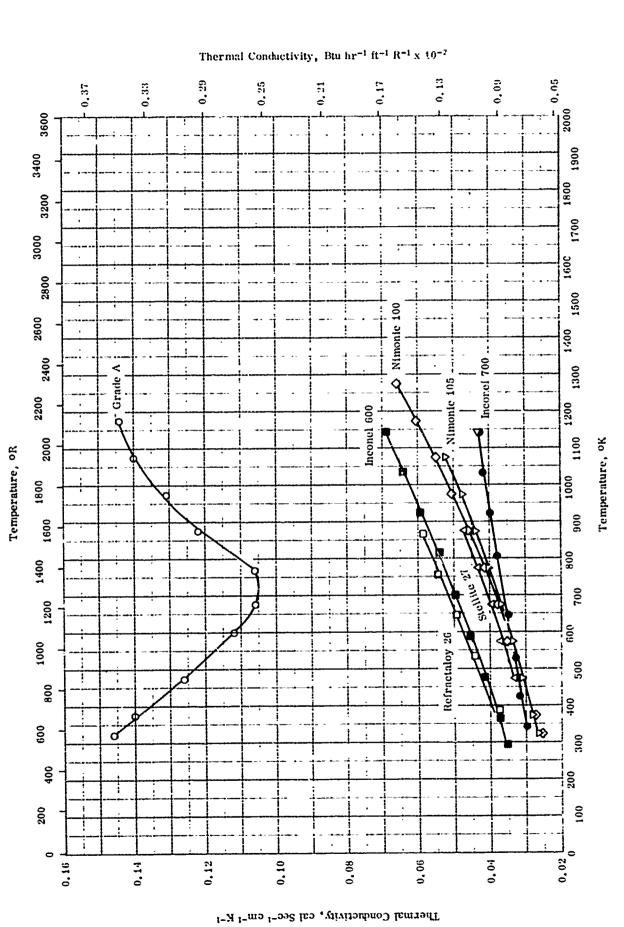
Electrical Resistivity, ohm om z 10^6

ELECTRICAL RESISTIVITY -- NICKEL + COBALT + ΣX_1

Remarks	First heating at 12 C min ⁻¹ ; author reports same values offer the following heat treatment during test; heated to 950 C in 75 min. held 1 hr at 950 C, cooled to 450 C in 4 min., heated to 600 C in 7 min. and held 16 hrs at 600 C; cooling during test at 2. 5 C min. ⁻¹ . First cooling at 75 C min. ⁻¹ after the above mentioned first heating to 950 C in 75 min.
Sample Specifications	46. 1 Mi, 24. 86 Co, 18. 74 Cr, 7. 02 Fe, and 2. 19 Ti Same at above.
Rept. Error %	
Temp.	618-1223
Ref.	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Sym	О Б



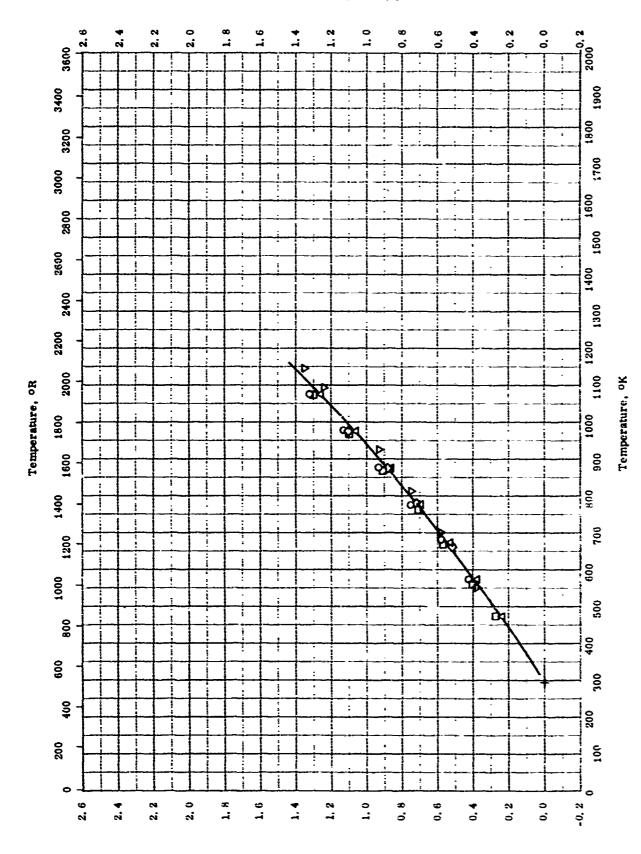
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THERMAL CONDUCTIVITY -- NICKEL + COBALT + Σ_{N_1}

THERMAL CONDUCTIVITY -- NICKEL + COBALT + EX

Remarks						Inst three points extrapolated.		Wrought.	
Sample Specifications	Grade A; 98, 19 Ni, 0.746 Co, 0.705 Mo, 0.26 Fe, 0.063 Cu, and 0.036 P.	Refractalcy 26; 37.0 Ni, 20,0 Co, 18,67 Fe, 18,0 Cr, 3.0 Mo, 3.0 Ti, 0.3 Al, and 0.03 C.	Stellite No. 27, (AMS-5378, NRDC-60); 30 < Co, 23-29 Cr, 5.0-7.0 Mo, 2.0 > Fe, and 0.35-0.50 C; density 513 lb ft ⁻³ .	Nimonic 100; 20 Co, 11.1 Cr, 5, 22 Al, 5, 0 Mo, 1, 07 Ti, 0.28 Si, 0, 24 C, 0, 04 Cu, and 0, 03 Mn.	Nimonic 105; 18-22 Co, 14-16 Cr, 4-6 Al, 4-6 Mo, 3.0 max Fe, 0.5-2.0 Tl, 1.0 max Mn, 0.5 max Cu, and 0.3 max C.	45 NI, 28 Co, 15 Cr, 3 Mo, 3 AI, 2, 2 TI, 9, 7 Fe, 0, 25 SI, 0, 16 C, 0, 10 Mn, and 0, 008 S,	Inconel 600; 73, 55 NI + Co, 16 Cr, 7, 55 Fu, 2, 30 Nb + Ta, 0, 3 Si, 0, 2 Mn, 0, 04 C, 0, 03 Cu, and 0, 005 S.	Incond 700; 46.0 NI, 29 Co, 15 Cr, 3.2 AI, 3 Mo, 2.2 TI, 0.8 Fe, 0.25 Si, 0.13 C, and 0.08 Mn.	
Rept. Error%		+i							
Temp. Runge oK	323-1173	380-867	473-873	323-1073	323-1273	343-1144	294-1144	1144	
Ref.	53-2	51-3	47-2	9-09	9-09	58-10	62-7	80-8	
Syl Bol	0	D	٥	D	♦	•	•	▽	



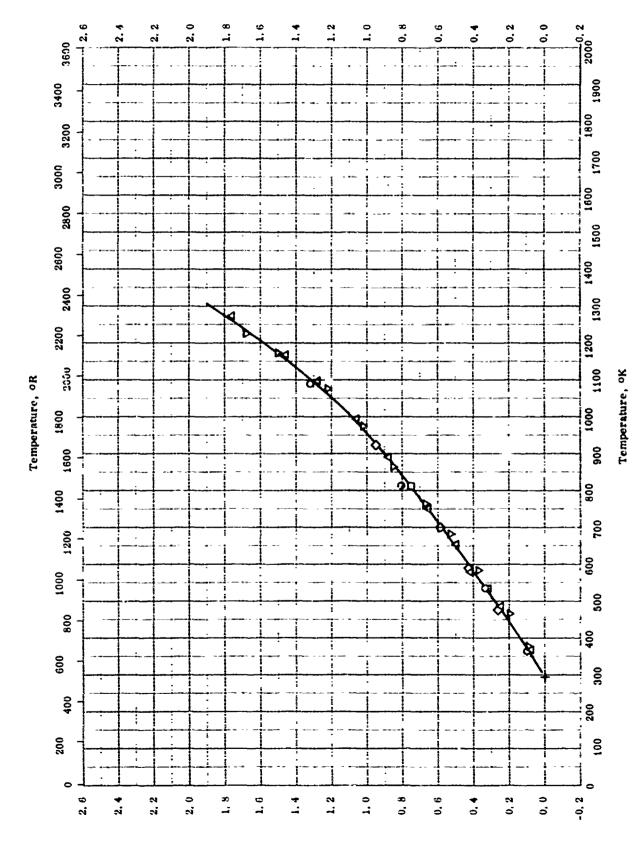
THERMAL LINEAR EXPANSION -- MCKEL + COBALT + Σx_i (34< NI < 38)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- NICKEL + COBALT + ΣX_l (34 · Ni - 38)

1	Range of	Lings.	Sample Specifications	Remarks
<u> </u>	473 - 1075		DVL 121 a (German Design.); 34, 1 Nl, 25, 4 Co, 14, 6 Cr, 13, 8 Fe, 5, 0 Mo, 4, 75 W, 1, 35 Ta, 0, 54 Mn, 0, 45 Si, and 0, 04 C, density 545, 2 Ib ft ⁻³ .	Rolled.
<u> </u>	473-1073		DVL 3214 (German Design.), 34, 2 Ni, 25, 5 Co, 14, 8 Cr, 17, 7 Fe, 5, 2 Mo, 4, 5 W, 1, 08 Ti, 0, 62 Mn, 0, 40 Si, and 0, 04 C, density 538, 7 B 11 ⁻³ .	Rolled.
;	473-1073		DVI, 325 a (German Design.); 34,3 Ni, 25,1 Co, 14,9 Cr, 4,9 Mo, 4,88 Ta, 4,54 W, 0,53 Mn, 0,49 Si, and 0,04C; density 554, 1 lb 1t ⁻³ .	Rolled.
-	473-1073		DVL 32 (Ger. Design.); 35, 2 M, 24, 5 Co, 15, 4 Fe, 14, 6 Cr, 4, 7 W, 4, 46 Mo, 9, 71 Mn, 9, 44 Si, and 9, 03 C; density 536, 3 in tr ³ ;	Rolled.
õ	589-1143		Haynes Stellite (AMS-5378) Alloy No. 27 NR-60; nominal; 30, 0 Co min, 23, 0 - 29, 0 Cr, 5, 0 - 7, 0 Mo, 2, 0 Pe max, and 0, 35 - 0, 50 C; density 513 lb ff ⁻³ .	



Thermal linear expansion -- Nickel + Cobalt + ΣX_1 (46< Ni < 95)

Thermal Linear Expansion, percent

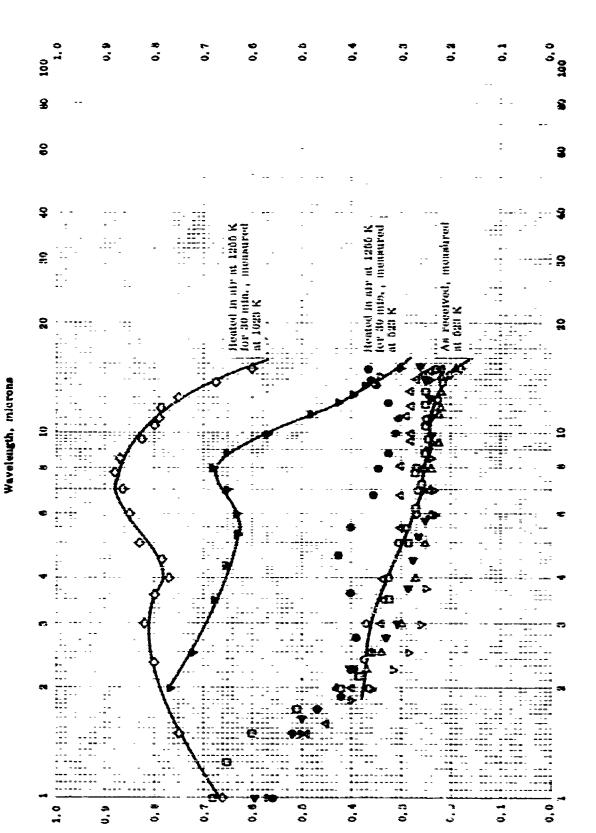
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THERMAL LINEAR EXPANSION -- NICKEL + COHALT + ΣN_1 (46+ N1+ 00)

RUTERENCE INFORMATION

Remarks					
Sample Specifications	46, 1 Ni, 24, 86 Co, 18, 74 Cr, 7, 62 Fe and 2, 19 Ti,	Numente 1905, nominat; 18 - 22 Co., 10 - 12 Cr., 4, 5 - 5, 5 Mo., 4 - 6 A), - 2 Fe, 1 - 2 Ft, - 9, 5 St and - 0, 3 C; density 502 ID R 3,	Nickel 204, International Nickel Co. (notatnal) 95, 2 Nt, 4, 50 Co. (0, 20 Mt, 0, 46 C, 0, 66 Fe, 0, 62 Cu, 0, 92 St and 0, 995 St density 9, 321 B in, 3	Incomed 700, International Nickel Co.; nominal 46, 0 Mi, 28, 5 Co., 16, 0 Cr., 3, 76 Mo, 3, 00 Mi, 2, 20 Ti, 0, 70 Fe, 0, 30 Si, 0, 12 C., 0, 10 Mn, 0, 05 Cu and 0, 007 S. density 0, 295 lb in, 73 and M. P. 2375 - 2450 F.	AISI-699, 38 Ni, 30 Co, 18 Cr. 16 Fe, 3,2 Mo, 2,75 Ti, 1,0 Si, 0,8 Mn, 6,2 Al and 0,03 C, density 8,24 gcm ⁻³ and M. P. 2450 -2500 F.
Rept.					
Temp. Rume of	1221-262	987-1546	294 - 10x9	291-1042	25. 20. 20.
	42-2	56 -37		÷.	55 54 54 54
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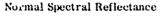
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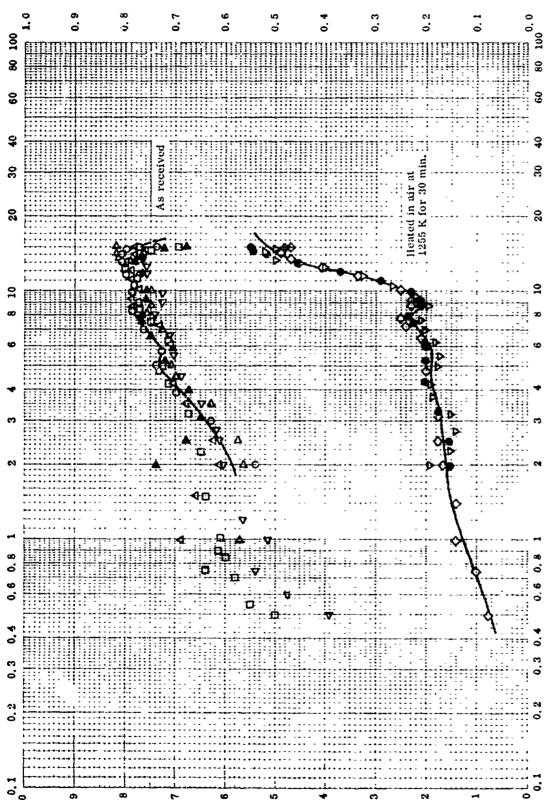
NORMAL BURGTRAL EMPTTANCE ... SICKEL - CONALT - EX. (Astroloy)

1229

NORMAL SPECTIVAL EMITTANCE -- NICKEL + COBALT + ΣX_1 (Astroloy)

Remarks	As received.	Same as above; different specimen.	Same as above; different specimen.	Heated ii, air at 1255 K for 30 min.	Same as above; different specimen.	Same as above; different specimen.	Heated in a 7,6 × 10 ⁻⁵ mm Hg vacuum at 1255 K for 30 min.	Same as above; different specimen.	Same as above; different specimen.	
Sample Specifications	Commercial Astroloy; nominal: 56, 8 Ni, 15 Co, 5, 25 Mo, As received, 5 Cr, 4, 4 Al and 3, 5 Ti, 0, 66 C.	Same as above,	Sanie as above.	Same as above.	Same as above.	Same as above,	Same as above,	Same as above.	Same as above.	
Rept. Error%										
Wavelength Range, µ	2, 0-15, 00	1, 50-15, 60	1, 0-15, 00	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	
Temp. Ok	523	773	1023	523	77:3	1023	523	773	1023	
Ref.	67-79	62-19	62-19	62-19	62-19	62-19	62-79	62-19	62-19	
Sym	0	4	0	>	•	\(\)	Δ	D	Ą	





Normal Spectral Reflectance

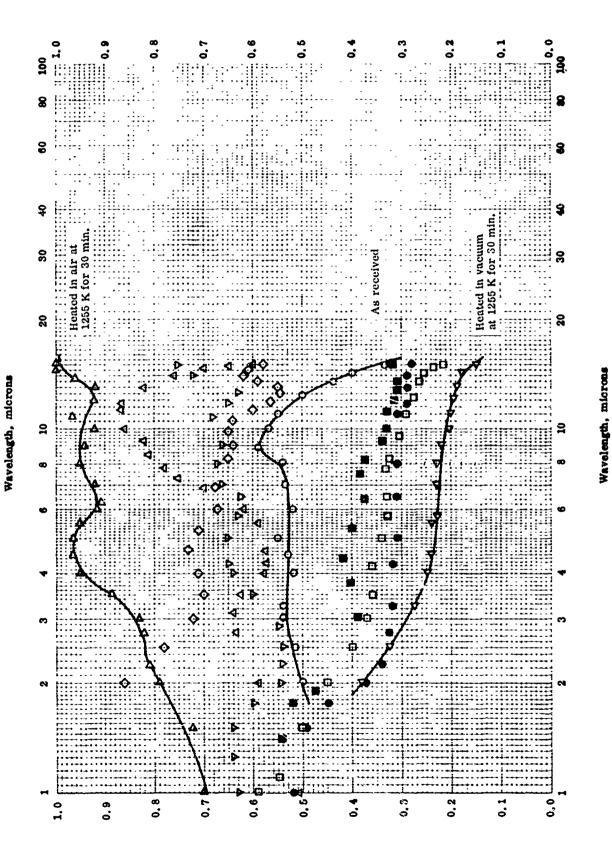
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NORMAL SPECTRAL REFLECTANCE -- NICKEL + COBALT + IN, (Astroloy)

Wavelength, microns

NORMAL SPECTRAL REFLECTANCE -- NICKEL $^+$ COBALT $^+$ ΣX_1 (Astroloy)

Remarks	As received; 523,2 K source.	The above specimen with 773.2 K source.	The above specimen with 1273 K source.	Heated in air at 1255 K for 30 min.; 523, 2 K source.	The above specimen with 773,2 K source.	The above specimen with 1273 K source.	Heated in a 7,6 x 10 ⁻⁵ mm Hg vacuum at 1255 K for 30 min.; 523,2 K source.	The above specimen with 773,2 K source.	The above specimen with 1273 K source.			
Sample Specifications	Astrolloy, nominal: 56,8 Ni, 15 Co, 5,25 Mo, 5 Cr, 4.4 Al, 3.5 Ti and 0,06 C.	Same as above.	Same as above.	Commercial astrolloy.	Scme as above.	Same as above.	Commercial astrolloy.	Same as above.	Same as above.			
Rept. %												
Wavelength	2,00-15,00	1, 00-15, 00	0.5 -15.00	2,00-15,00	2,00-15.00	0.5 -15.00	2, 00-15, 90	1.00-15.00	0, 50-15, 00			
Temp. "K	. 322	< 322	/ 322	< 322	< 322	< 322	< 322	< 322	< 322			
Ref.	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19	62-19			
Sym	0	٥	۵	D	•	\(\)	A	Δ	▽			



NORMAL SPECTRAL EMITTANCE -- NICKEL + COBALT + EXI (Udimet 500)

Normal Spectral Emittance

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NORMAL SPECTRAL EMITTANCE - - NICKEL + COBALT + EN₁ (Udmet 509)

Remarks	As received,	Same as above; different specimen,	Same as above; different specimen.	Heated in air at 1255 K for 30 min.	Same as above; different specimen.	Same as above; different specimen.		Same as above; different specimen.	Same as above; different specimen.	
Sample Specifications	Commercial Udimet 500, nominal: 44, 1 Ni, 20 Co, 20 Cr, 5 Mo, 4 Fe, 3, 25 Ti, 2, 5 Al, 0, 75 Mn, 0, 75 Si, 0, 15 C and 0, 01 B.	Same as above,	Same as above.	Commercial Edinet 509,	Same as above.	Same as above,	Commercial Udimet 500.	Same as above.	Same as above,	
Rept. Error'd										
Wavelength Rurge, µ	2	1, 00-15, 00	1, 00-15, 00	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	2, 00-15, 00	1, 00-15, 00	1, 00-15, 00	
Temp, ⁹ K	623	773	1023	:: ::	273	1023	::3°C	773	1023	
Ref.	62-10	62-19	62-19	65-19	62-79	62-19	62-19	62-19	61-29	
Sym	0	9	∢	\(\)	Þ	Δ	∇·	•	•	

Wavelength, microns

NORMAL SPECTRAL REFLECTANCE -- NICKEL + C'AALT + ΣX_1 (Udinet 500)

Normal Spectral Reflectance

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NORMA!. SPECTHAL REFLECTANCE -- NICKEL + COBALT + EXI (Udimet 500)

E 2	Ref.	Tomp, ^o K	Wavelength Range, µ	Rept. Error%	Sample Specifications	Remarks
0	62-19	322	2, 00-15, 00		Commercial Udimet 500, nominal; 44, 1 Ni, 20 Co, 20 Cr. As received; 523, 2 K source. 5 Mo, 4 Fe, 3, 25 Ti, 2, 5 Ai, 0, 75 Mn, 0, 75 Si, 0, 15 C and 0, 01 B.	As rucelved; 523, 2 K source.
0	62-19	. 322	1, 00-15, 00		Sume as above,	The above specimen with 773, 2 K source.
4	62-10	< 322	0, 60-15, 00		Sume as above,	The above specimen with 1273 K source.
\(\)	62-19	× 322	2, 00-15, 00		Commercial Udimet 500,	Heuted in air at 1255 K for 30 min,; 523, 2 K
						sonce.
Þ	62-19	2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1, 00-15, 00		Same ан ароуа,	The above specimen with 773, 2 K source.
Δ	62-10	< 322	0, 50-15, 00		Same as above.	The above specimen with 1273, 3 K source.
▽	62-19	83 83 87 V	2, 00-15, 00		Commercial Udimet 600,	Heated in a 7, 6 x 10 ⁻⁶ mm Hg vacuum at 1256 K for 30 mh.; 323, 2 K souree,
•	62-10	< 322	1, 00-15, 00		Same as above,	The above specimen with 773, 2 K source.
4	62-19	7 387	0, 50-15, 00		Same as above.	The above specimen with 1273 K source.

PROPERTIES OF NICKEL + COPPER + ΣX_i

REPORTED VALUES

Density:	g cm ⁻³	lb ft−³
O K-Monel	8.456*	527.9*
O K-Monel	8.46	528

* Most probable value for alleys of this composition.

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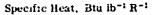
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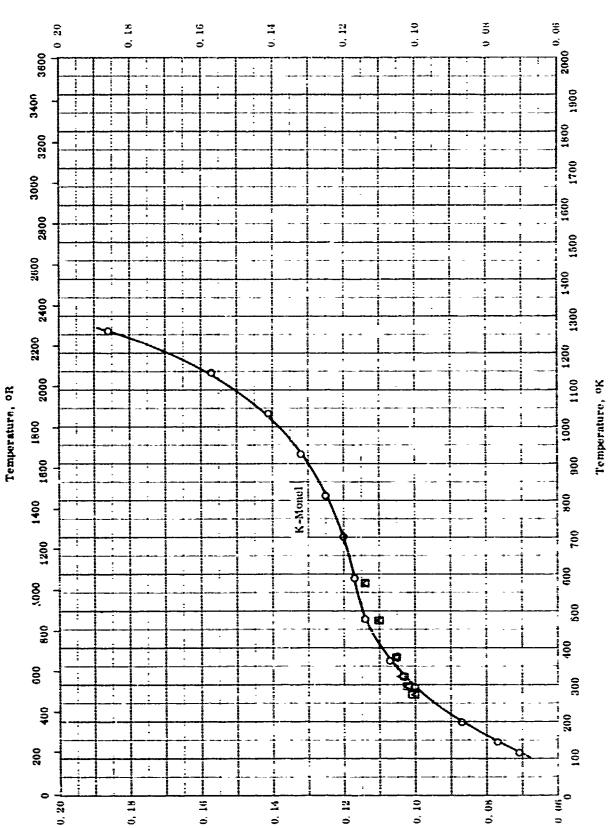
PROPERTIES OF NICKEL + COPP) R + EX

REFERENCE INFORMATION

Remarks	Hot-rolled, unnealed 1 hr at 900 C, and water-quenched,	Same us above,
Samule Specifications	K-Monel; nominal composition; 46 Ni, 30 Cu, and 3 Ai.	K-Monel; 65, 51 Ni, 20, 23 Cu, 3, 02 Al, 0, 86 Fe, 0, 60 Mn, 0, 13 C, 0, 09 Sl, and 0, 005 S.
Ropt.		
Range 95	808	20.7
		- - -
	0	0







SPECIFIC HEAT -- NICKEL + COPPER + EX

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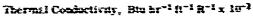
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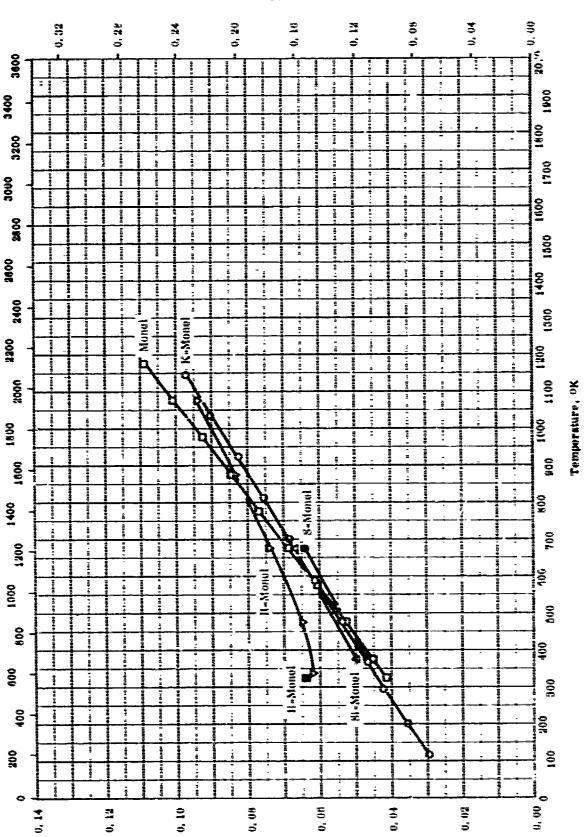
SPECIFIC HEAT -- NICKEL + COPPER + EX

REFERENCE INFORMATION

Remarks	Annealed 1 hr at 1650 F and water quenched.									
Sample Specifications	K-Monet, nominal composition 66 Nt. 29 Cu, and 3 Al; density 627 B it "3 at 32 F.	Monel; 66, 9 N1, 29, 8 Cu, 1, 6 Fe, 1, 9 Ma, 9, 15 C, and 9, 97 St,	Monel, 67, 1 M, 20, 3 Cu, 4, 8 Fe, 1, 9 Mn, 9, 18 C, and 9, 07 Si,							
Rept.		n .0. u) :::				 			
Temp. Parage OX	_	273-272	273-573							
18-1.	1-49	91-10	23 - ES	5 Peo						
	0	0	₫			 				







Temperature, ox

THERMAL CONDUCTIVITY ... NICKEL . COPPER . BX

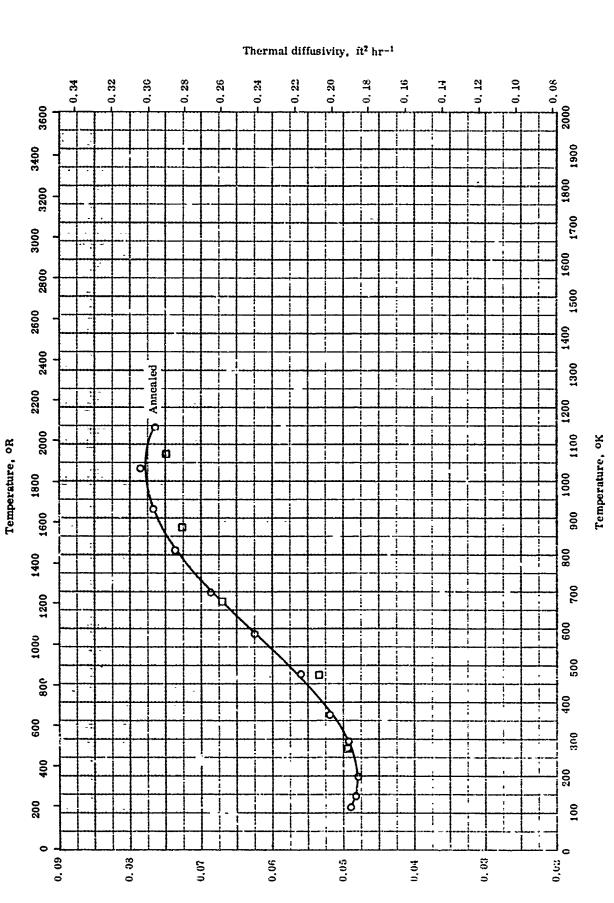
Thermal Conductivity, cal Sec 1 cm $^{-1}$ K $^{-1}$

THERMAL CONDUCTIVITY -- NICKEL + COPPER + ΣX_{j}

Remarks	Hot-rolled; annealed 1 hr at 1650 F and water-quenched.		Cast.			Cast.			
Sample Specifications	K-Monet; 65.51 Ni, 29.23 Cu, 3.02 Al, 0.86 Fe, 0.60 Mn, 0.13 C, 0.09 St, and 0.005 S; density 528 lb ft ⁻³ .	Monel; 66.2 Ni, 30 Cu, 38 Fe, 0. 919 Mn, 0.407 Co, 0.40 C, 0.135 Si, and 0.032 Mg.	Si Monel; 65.39 Ni, 28.71 Cu, 2.09 Si, 1.86 Fe, 1.54 Mn, and 0.41 C.	R-Monel; 67.0 Ni, 30.0 Cv. 1.40 Fe, 1.0 Mn, 0.15 C, 0.05 Si, 0.035 S; nominal composition.	S Monel; 62-65 Ni, 30.25-31.75 Cu, 3.5-5.0 Si, 3.5 > Fe, 0.5-1.5 Mn, and 0.25 C; nomiral composition.	H Monel; 61-68 Ni, 23.95-32.95 Cu, 2.7.3.7 Si, 2.5 Fe, 0.5-1.5 Mn, 0.3 C, and 0.05 S.	•		
Rept. Error %			2.0						
Temp. Range ^O K	1:7-1145	323-1173	373-673	337-1073	373-673	323			
Ref.	51-6	53-2	39-1	53-8	54-3	56-8			
Sym	0	0	<	D	•	8	·····		



THERMAL DIFFUSIVITY -- NICKEL + COPPER + $\Sigma X_{\rm I}$ (K-moncls)



Thermal diffusivity, cm2 Sec-1

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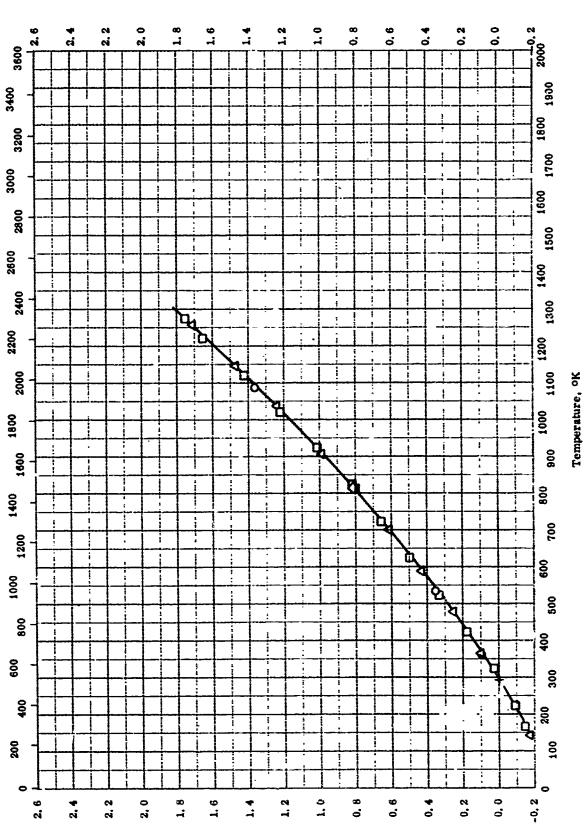
Temperature, oR

THERMAL DIFFUSIVITY -- NICKEL + COPPER + EXI (K-monels)

			 _		
Remarks	Hot rolled; annealed at 1650 F for 1 hr and water quenched.				
Sample Specifications	K-monel; 65. 51 Ni, 29. 23 Cu, 3. 02 Al, 0. 86 Fc, 0. 60 Mn, 0. 13 C, 0. 09 Si, and 0. 005 S.	K-monel; 66 Ni, 29 Cu, 3 Al, and 2.0 others; nominal composition from Metal's Handbook.			
Rept. Error %					
Temp. Range ^o K		273-1073			
Ref.	58-1	56-1			
Sym	0	۵	 	 	







Temperature, oR

THERMAL LINEAR EXPANSION -- NICKEL +COPPER + Σx_1 (29 - 30 Cu and 2, 8 - 3, 5 Al)

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Thermal Linear Expansion, percent

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Thermal linear expansion -- nickel, + copper + Σx_1 (29 - 30 Cu and 2, 8 - 3, 5 AI)

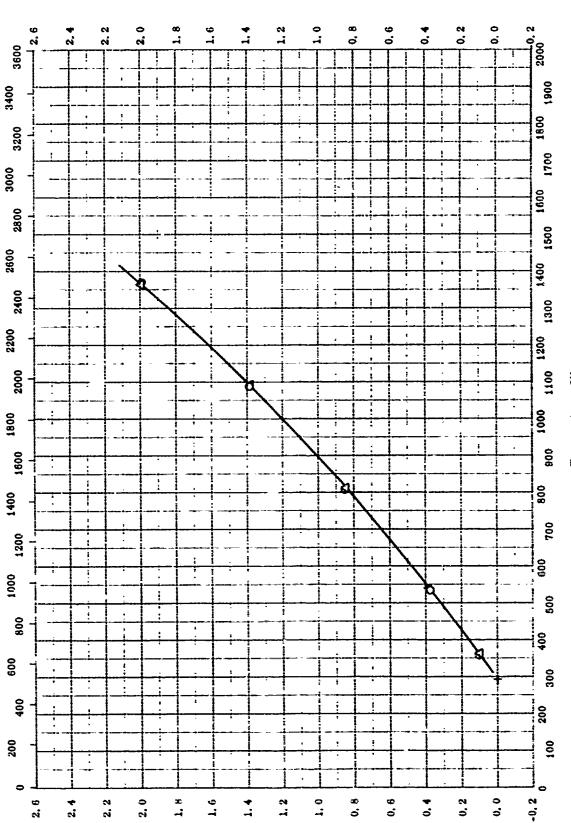
REFERENCE INFORMATION

Remarks	Not rolled, unnealed 1 hr at 1650 F, and water quenched; tested at 1, 5 - 2, 5 C min ⁻¹ heating rate in argon.	Hot rolled, annealed 1 hr at 1650 F, and water quenched; tested in vacuum.		
Sample Specifications	K Monel; 65, 51 Mi, 29, 23 Cu, 3, 02 Al, 0, 86 Fe, 0, 60 Mn, 0, 13 Hot rolled, annealed 1 hr at 1650 F, and water C, 0,09 Si, and 0,005 S; density 528 lb ft ⁻³ .	K-Monel; nominal: 66 Nl, 30 Cu, 3,5 Al, 1,5 Fe, 0,20 max C, and < 5 others.	Monel K-500, formerly "K-Monel" from International Nickel Co.; nominal: C5,0 Ni, 29,5 Cu, 2,80 Al, 1,00 Fe, 0,60 Mr, 0,50 Ti, 0,15 C, 0,15 Si, and 0,005 Si density 0,306 lb in. ⁻³ and M. P. 2400 - 2400 F.	Monel 501, formerly "KR-Monel" from International Nickel Co.; nominal: 65,0 Ni, 20,5 Cu, 2, 80 Al, 1,00 Fe, 0,60 Mn, 0,50 Ti, 0,23 C, 0,15 Si, and 0,005 S; density 0,306 lb in."3 and M, P, 2400 = 2460 F.
Rept. Error%				
Temp. Runge oK	83-1274	117-1256	294-1089	294-1089
Ref.	51-6	58-1	65-4	654
Sym	0	٥	0	⋄

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Temperature, oR

Temperature, oK

THERMAL LINEAR EXPANSION -- NICKEL + COPPER + ΣN_1 (31.5 Cu and 1.35 Fe)

Thermal Linear Expansion, percent

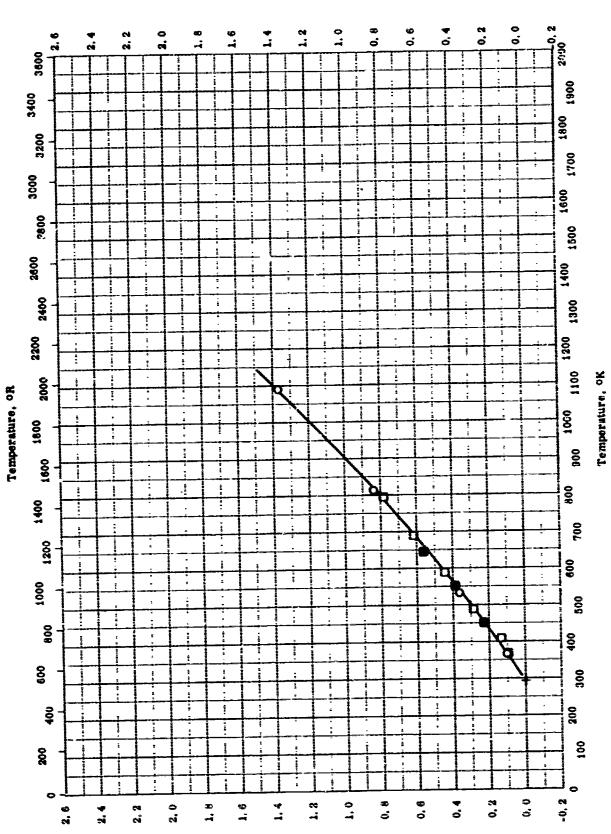
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THERMAL LINEAR EXPANSION -- NICKEL + COPPER + Σx_1 (31.5 Cu and 3.35 Fe)

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Remarks						
Sample Specifications	Monel 400; formerly "Monel" from International Nickel Co.; nominal: 66,0 Ni, 31,5 Cu, 1,35 Fe, 0,80 Mt, 0,15 Si, 0,12 C, and 0,005 Si density 0,319 lb in, 3 and M, P. 237c - 2460 F.	Monel R-405; formerly "R-Monel" from international Nickel Co.; 1.0minal: 66.0 M 31.5 Cu. 1.35 Fe, 0.90 Mn, 0.18 C, 0.15 Si, and 0.005 S: density 0.319 lb in." 3 and M. P. 2370 - 2460 F.				
Rept. Error %			 	 		
Temp. Ennge ok	204-1366	204-1366				
Ref.	65-4	1- 99				
il og	٥	C	 	 	 	



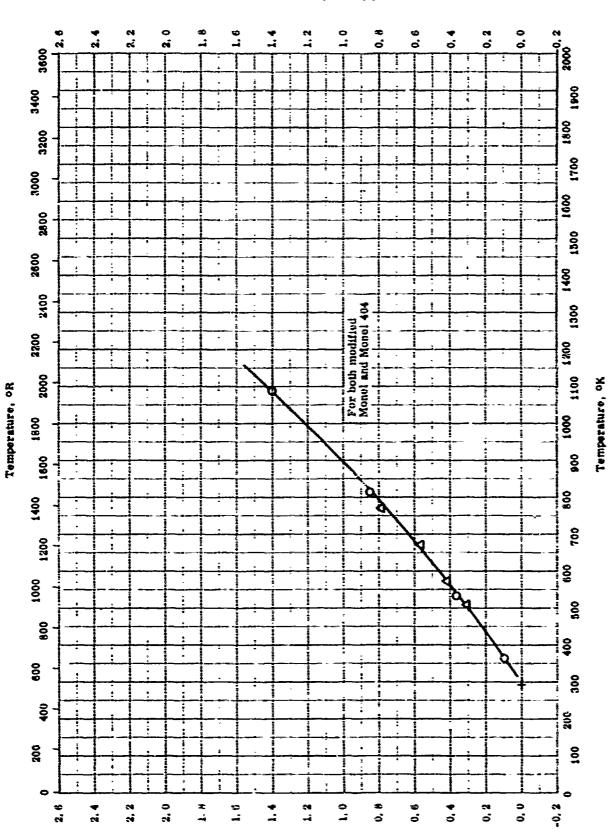
THERMAL LINEAR EXPANSION -- NICKEL + COPPER + ΣX_1 (26 -- 40 Cu and 1, 8 - 2 Mn)

Thermal Linear Expension, percent

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THERMAL LINEAR EXPANSION -- NICKEL + COPPER + 5N₁ (26 - 40 Cu and 1, 8 - 2 Mn)

Remarks	Hot rolled; average of 4 samples within range of ± 1 %; heating.	Cooling data of all we specimens.	
Sample Specifications	Monei; 66, 2 - 67, 6 Ni, 26, 7 - 29, 3 Cu, 2,00 Mn, 1,70 Fe, 0,24 Hot rolled; average of 4 samples within range of C, and 0,06 S.	Вате ин акоус.	Monel 403; International Nickel Co.; norminal: 57,5 Ni, 40,0 Cu, 1,80 Mn, 0,50 Fe, 0,25 Si, 6,12 C, and 0,005 Si density 0,320 lb in. "3
Ropt.			
Temp. Range 9K		369-792	294-1089
Rof.	20-02	57-52	65m4
Sym	0		0



Tiermal linear expansion -- Nickel + Copper + TX₍ (Miscellangour)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION ... NICKEL + COPPER + ΣN_1

REFERENCE INFORMATION

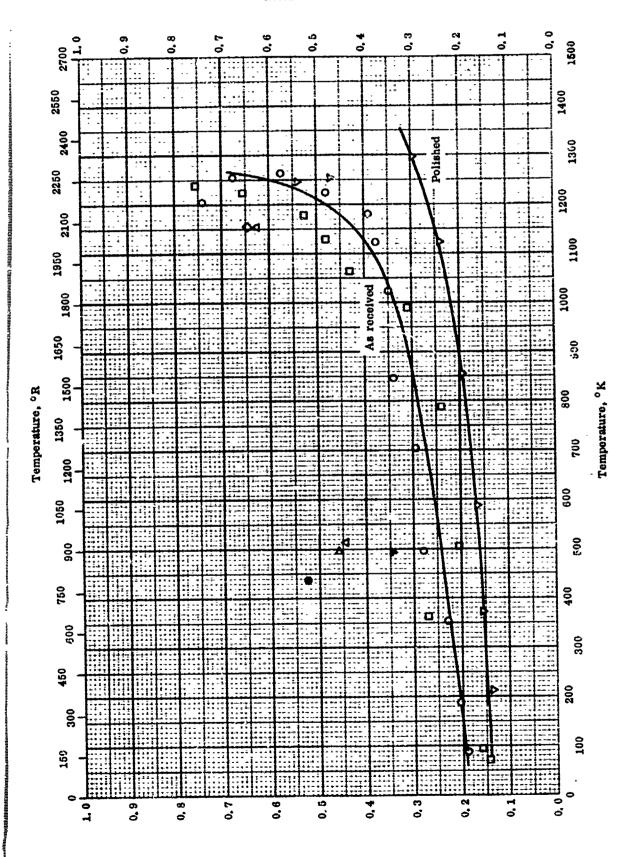
	Cent in sand mold; average of heating and cooling range of a 1%.	
Satistican summer companies and companies and companies and companies and companies and companies and companies	Modified Monel; 61,) Nt. 25 Cu Si each,	Monel 404; Internutional Nickel Co.; nontinul; 55, 0 Ni, 44, 0 Cu, 0, 00 C, 0, 05 Fe, 1, 02 Ai, 0, 02 Si, 0, 01 Mn, and 0, 605 Si dentity 0, 321 lb in, "1 dentity 0, 321 lb in, "7
Kept.		
Temp, Rango OK		20-4 10-89
	57±62	₹-1 10 10 10 10 10 10 10 10 10 10 10 10 10
	Q	0

Hemisphencal Total Emplyance ... Nickel - Copper - Ex

Tompermure, bx

Hemispherical total emittance -- nickel + copper + Σx_1

Ropt. Ropt. Sample Specifications 304 Monei: nominal: 66.0 M, 31.5 Cu, 1.35 Fe, 0.90 Mn, 0.15 St, 0.12 C, and 0.005 S. 0.12 C, and 0					•	Clean surface; measured in air.	Remarks
						Monel: nominal: 66.0 Ni, 31,5 Cu, 1,35 Fe, 0,90 Mn, 0,15 Si, 0,12 C, and 0,005 S.	
nnge ^O K							Rept. Error %
<u> </u>						304	Temp. Range ok
Ref. 48-7						48-7	Ref.
System o				 		0	Sym



NORMAL TOTAL EMITTANCE -- NICKEL + COPPER + DX1 (K Monel 5700)

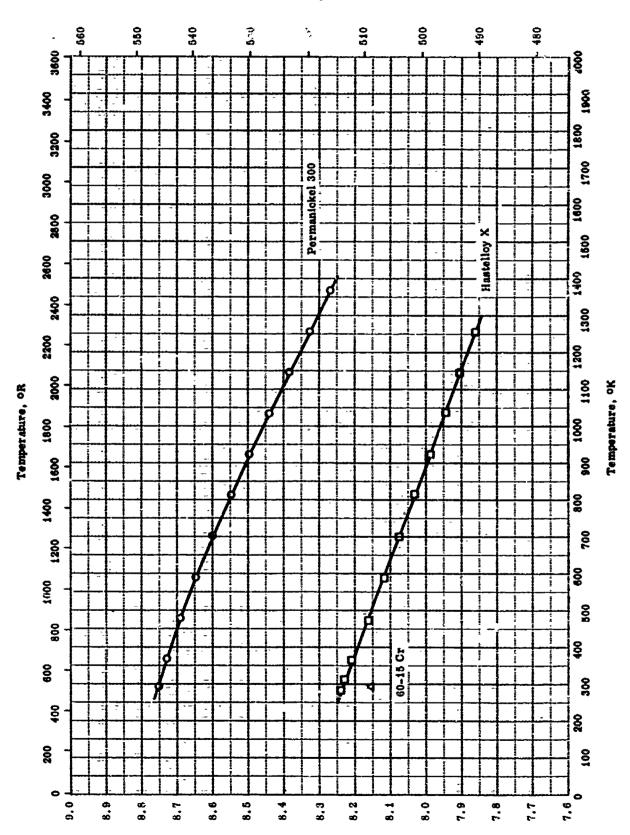
Normal Total Emittance

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NORMAL TOTAL EMITTANCE -- NICKEL + COPPER + EX. (K Monel 5700)

Remarks	As received; wiped; measured in helium (10 mi-	crons pressure); cycle 1 heating.	The above specimen; cycle 1 cooling.	The above specimen; cycle 2 heating.	The above specimen; cycle 2 coolin,	Scrubbed, washed and wiped; measured in helium (10 microns pressure); eyele I heating.	The above specimen; cycle 2 cooling.	Polished to a mirror like finish, washed; measured	is neithm (10 microns prossure); cycle i neating. The above specimen; cycle 3 cooling.	
Sample Specifications	K Monel 5700, nominal: 66 Ni, 30 Cu, and 3 Al.		Same as above.	Same as above.	Same as above.	K Monel 570v.	Same as above.	K Monel 5700.	Same as above.	
Rept. Error%								<u></u>	<i>9</i> 3	
Temp. Range eK	89-1205		514-1156	1166	497	72-1239	439	72-1247	497	
Ref.	54-27		54-27	54-27	54-27	54-27	54-27	54-27	54-27	
Sym	0		4	\$	Δ	0	•	Þ	>	

DENSITY -- NICKEL + IRON + EX



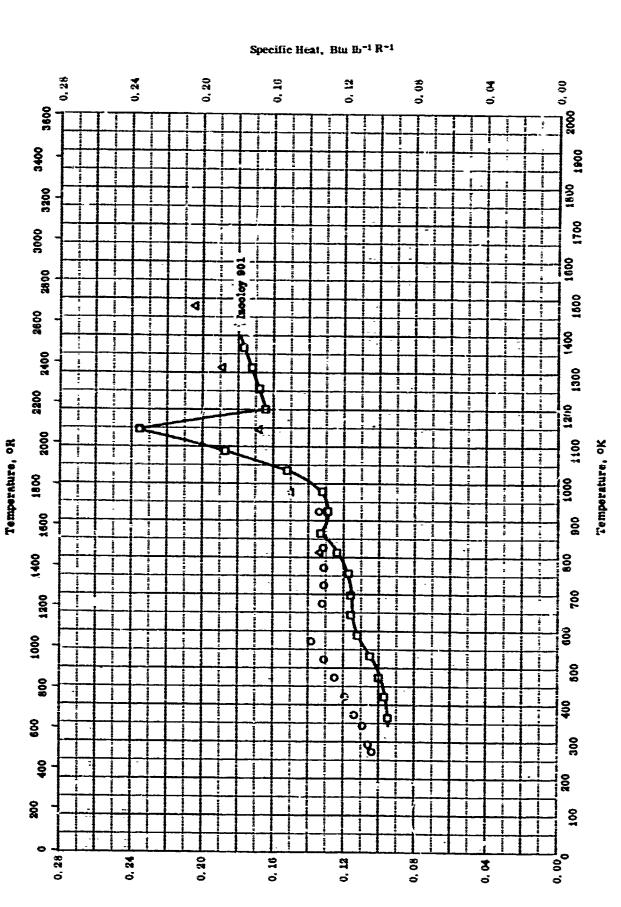
Dansity, gcm_3

DENSITY -- NICKEL + IRON + EX

REFERENCE INFORMATION

Remarks									
Sample Specifications	80-15 Cr (ASTM B83-46); 57.7 Ni, 23.92 Fe, 15.73 Cr, 1.14 Sl, 0.052 C, and 0.04 Mo.	45 Ni, 23.85 Fe, 22 Cr, 9 Mo. and 0.15 C.	Permanickel 300.						
Rept.									
Temp.	208	283-1255	294-1307				 		
Ref.	58-2	614	62-17				 		
Wico South	4	0	0						





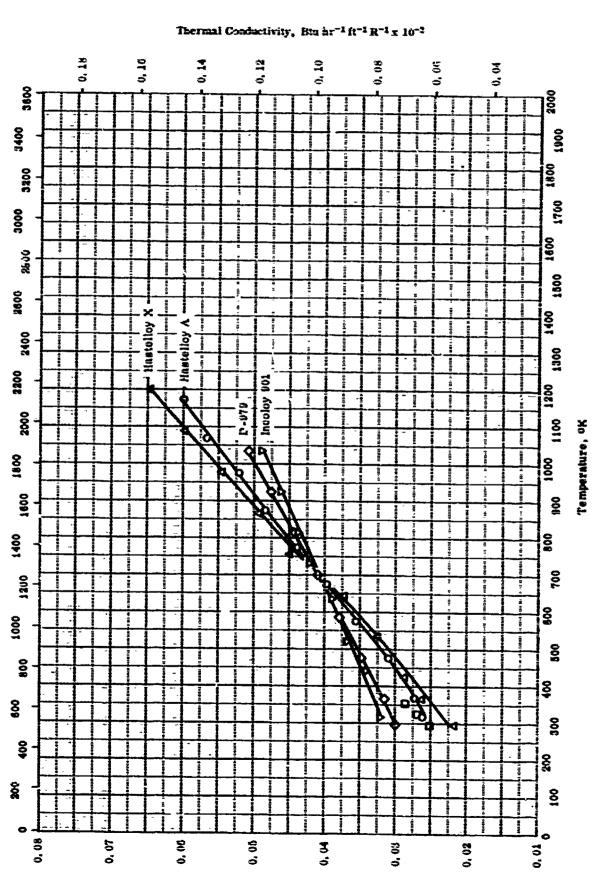
SPECIFIC REAT -- NICKEL + IRON + EX

Specific Ileat, cal g-1 K-1

SPECIFIC HEAT -- NICKEL + IRON + EX

Romarks	Cust; rolled at 1180 C, unnealed at 900 C, cold drawn and then annelaed at 700 C.	Rented 2 hrs at 2060 F and off quenched and then heated 24 hrs at 1975 and alr cooled.	
Sample Specifications	08.7 Ni, 0,30 Fu, 0, 'Mn, 0,20 Cu, 0,18 Mg, 0,17 C, 0,14 SiO ₂ , and 0,04 S.	Incaley 901; 40, 0 NI, 35, 0 Fe, 13, 0 Gr, 6, 0 Mo, 2, 4 Tl and 0, 05 C.	00-15 Gr (ASTM 1983-40); composition before test; 57, 70 Ni, 28, 92 Fu, 16, 73 Gr, 1, 14 Si, 0, 062 Cr, 0, 03 Mo, and after test; 67, 70 Ni,', 51 Fu, 15, 80 Cr, 1, 33 Si, 0, 050 G, and 9, 03 Mo; density 508, 9 lb ft ⁻³ .
Rept.		p-10	o 'e
Tamp. Ratae oK	858-ULZ	9921-996	805-1185
Ref.	55-18	69-14	D8-2
Sym Foot	0	0	4





THERMAL CONDUCTIVITY -- NICKEL + IRON + EX

Thermal Conductiving, cal Sec -1 rm -1 K-1

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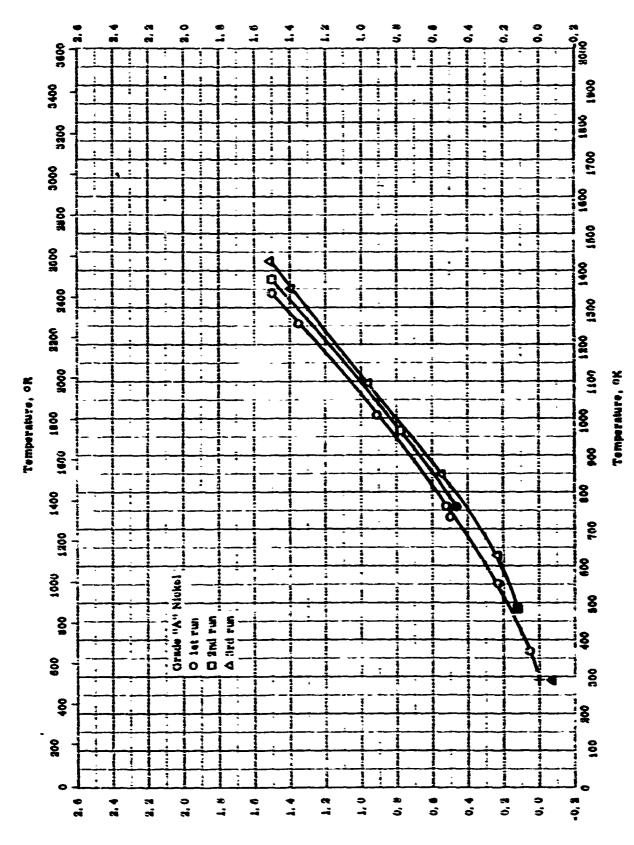
THERMAL CONDUCTIVITY -- NICKEL + IRON + EX

		Annealed at 1160 C.				
	#WILLOW BACKERS	, dastelloy A; 57, 1 Ni, 21, 4 Fe, 10, 0 Mo, 2, 5 Mn, and 0, 072 C.	Contracid; 56, 17 NI, 23, 16 Fe, 14, 62 Cr, 2, 02 Mn, 0, 73 Mo, and trace 8f.	Hastelloy X; 45 Ni, 23, 95 Fo, 22 Cr., 9 Mo, and 0, 15 C.	Incoloy 801: 42 Ni. 38 Fe, 12 Gr. 6 Mo, and 2. 5 Til. donally 0, 297 is in 2,	D-079; 27 Fu, 16 Cr., 3, 76 Mo, 3, 76 W, 3 Ft, 1 Al, 0, 6 Mn, 6, 6 Sf, 0, 06 C, and 0, 01 Il; density 0, 205 lb in 2.
	Frron. %	08				
- 4	Hange OK		200-002	294-1200	316-1033	2071033
7-8		2.3	T-40	440	6-00	*
NV III	3	Ð	0	4	D	♦



Thermal literic expansion -- Nickel + Hon + Ex.





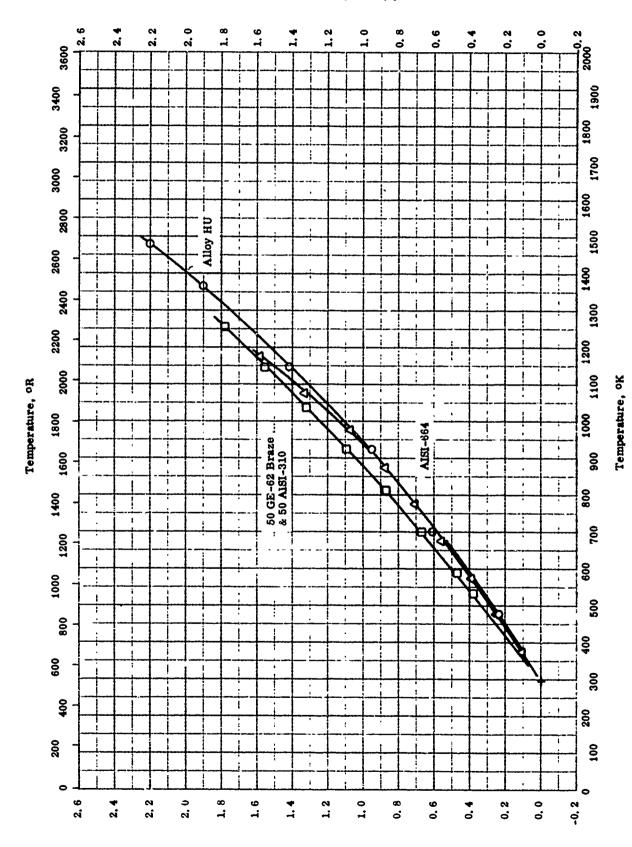
Thermal Linear Exponeion, percent

THERMAL LINEAR EXPANSION -- MULEL + IRON + ΣX_1 (Fe < 1.0)

REFERENCE INFORMATION

Remarks	Cold rolled from melt: measured in helium; heating.	Cooling of above specimen to 909 F.	Re-heating of above specimen to 2020 F.	Cooling of above specimen to 415 F.	Re-heating of above specimen to 2100 F.	Cooling of above specimen to 70 F.	
Sample Specifications	Grade "A"; J.M. Tully Metal and Supply Co.; 98, 12 Ni. 0.5 Fe, Cold rolled from melt: measured in helium; heat- 0.5 Si, 0.35 Mn, 0.25 Cu, 0.2 C, and 0.02 S; density 546 Ib ft ⁻³ by vol displacement.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Rept. Error%	81	83	23	~:	2	83	
Temp. Range ^O K	294-1339	760-1339	760-1378	486-1378	486-1422	294-1422	
Ref.	62-24	62-24	62-24	62-24	62-24	62-24	
Sym	0	•	0		٥	4	

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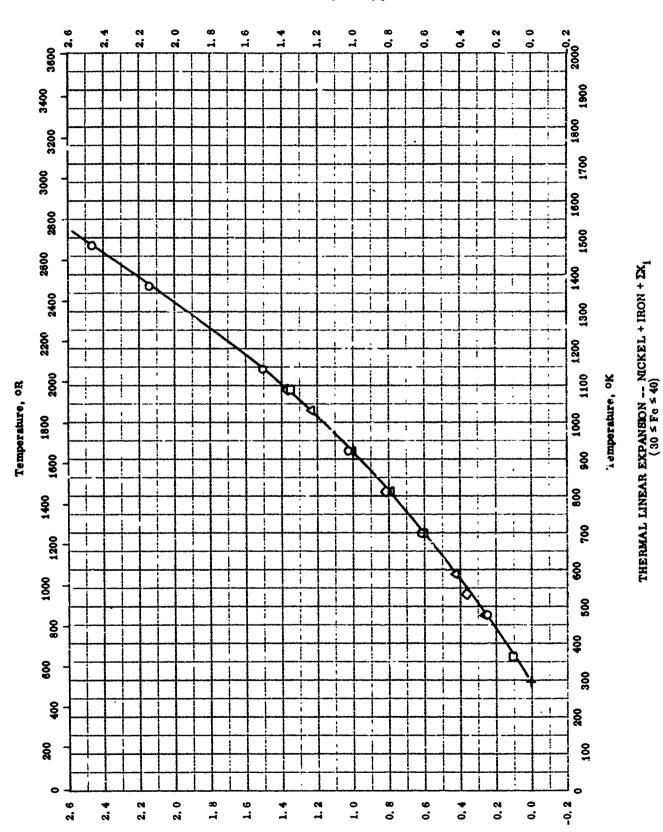
Thermal linear expansion -- Nickel + iron + Σx_i (19< F_0 < 26)

Thermal Linear Expansion, percent

THE RESERVE

THERMAL LINEAR EXPANSION -- MICKEL + IRON + ΣX_{i} (19< Fe < 26)

			
Remarks	Heated at 200 F per sec.	Arc melted, cast, and heated at 2260 R for 24 hrs in vacuum; data average of heating and cooling cycles at 5.5 F min -1.	
Sample Specifications	Alloy HU; 60.3 Ni, 19.1 Fe, 17.0 Cr, 1.43 Si, 1.13 Mn, 0.48 C, 0.23 Co, 0.22 Nb, 0.08 Mo, and 0.041 N.	50 GE-62 Braze and 50 AISI 310; nominal: 44.75 Ni, 25.6 Fe, 22.5 Cr, 6.25 Si, 1.00> Mn, and 0.125> C.	AISI-664; 44.3 NI, 22.8 Fe (by diff.), 14.9 Cr, 4.05 Mo, 3.65 W, 3.00 Ti, 1.05 Al, 0.25 Mn, 0.2 Si, 0.06 C, and 0.01 B; M. P. 2225-2550 F.
Rept. Error%			
Temp. Range ^O K	293-1478	533-1256	294-1173
Ref.	51-5	63-127	63-28
E Soli	v	0	٥



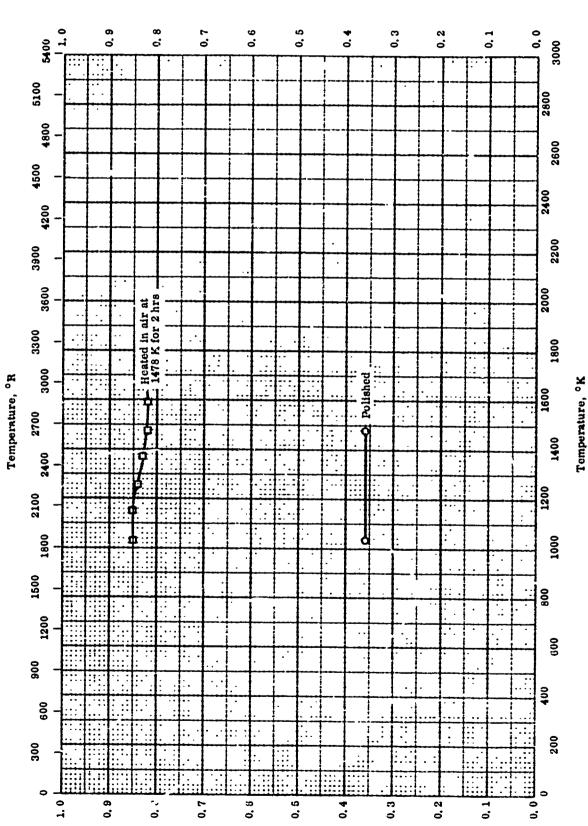
Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- NICKEL + IRON + ΣX_1 (30 s Fe s 40)

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Remarks	Heated at 200 F sec. 1.			
Sumple Specifications	Alloy HW; 40.0 Ni, 39.3 Fe, 17.2 Cr, 1,52 Si, 0.67 Mn, 0.66 C, Heated at 200 F sec ⁻¹ .	AIST 681; 42.5 NI, 35.87 Fe (by diff.), 12.5 Cr, 6.0 Mo, 2.5 Tl, 0.24 Mn, 0.20 Al, 0.12 Sl, 0.05 C, and 0.015 B; density 8.23 g cm ⁻³ .	AISI 682; 42.5 NI, 35.01 Fe (by diff.), 12.5 Cr, 5.7 Mo, 2.85 Ti. 0.2 Al, 0.09 Mn, 0.08 Si, 0.05 C, and 0.015 B; density 8.23 g cm ⁻³ .	Incoloy 825; formerly "Ni - O - Nel" from International Nickel Co.; nomin.il: 41.8 Ni, 30.0 Fc, 21.5 Cr, 3.0 Mo, 1.80 Cu, 0.90 Ti, 0.65 Mn, 0.35 Si, 0.15 Ai, 0.03 C, and 0.007 S; density 0.294 lb in. ⁻³ and M. P. 2500 - 2550 F.
Rept. Error%				
Temp. Range ok	293-1478	390-1089	300-1089	294-1089
Ref.	51-16	63-23	63-28	45
Sym	0	٥	0	♦





NORMAL SPECTRAL EMITTANCE -- NICKEL + IRON + $\Sigma X_{\rm I}$

Normal Spectral Emittance

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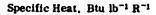
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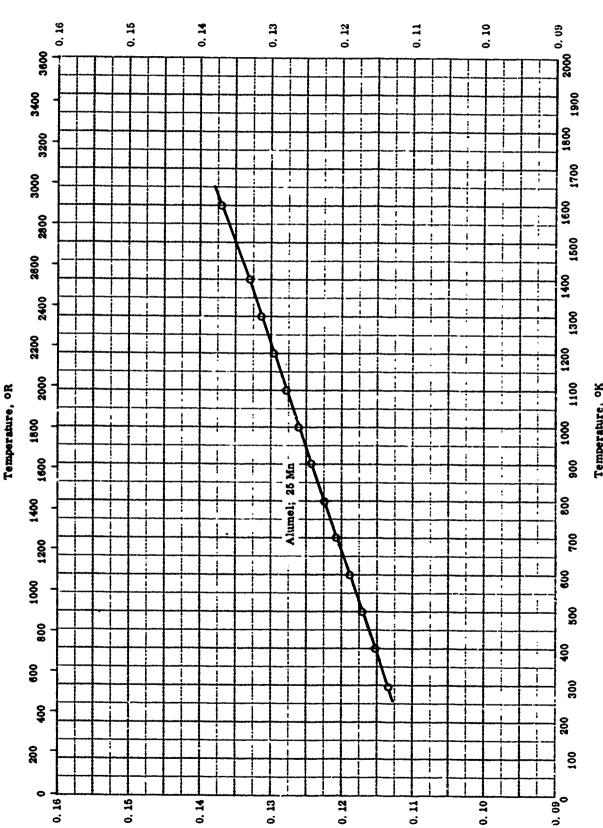
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NORMAL SPECTRAL FMITTANCE -- NICKEL + IRON + \(\)X_1

# Z	Ref.	Wavelength μ	\vdash	- 2		Remarks
	39-2	o, 65	1033-1478	ο	60 Ni, 24 Fe, and 16 Cr.	Polished with rouge paper; measured in purified hydrogen; emittance constant over the temperature range from 1033 to 1078 K.
0	39-2	0.65	1033-1589	89	60 Ni, 24 Fe. and 16 Cr.	Polished with rouge paper, heated in air at 1478 K for 2 hrs.
						
┨						







Specific heat -- nickel + manganese + Σx_i

Specific Heat, cai g"! K":

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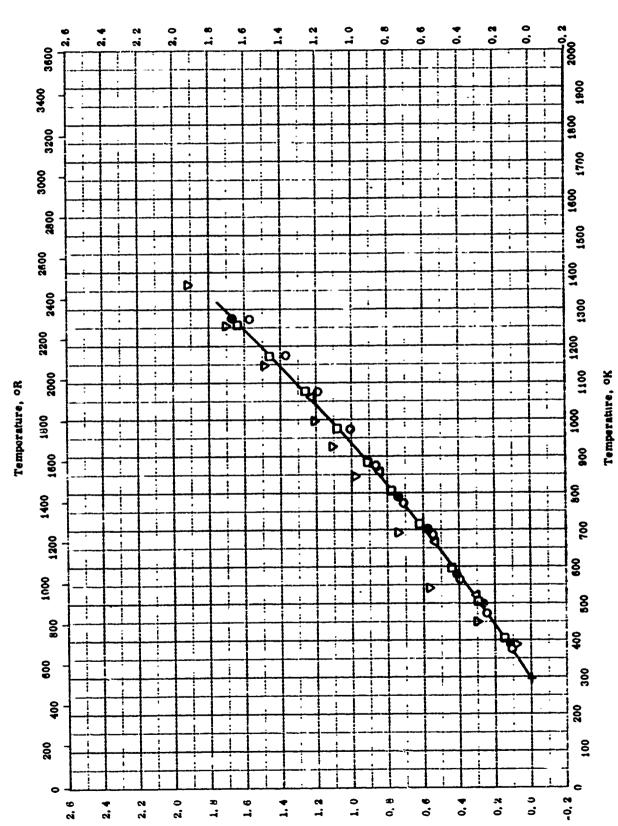
Specific heat -- nickel + manganese + ΣX_{j}

Remarks	
Sample Specifications	Aiumoli; 72 Ni, 25 Mn, 2 Al, and 1 Si.
Rept.	
Temp. Range of	
Ref.	63-13
E TO	0



A TANKETON

Thermal Linear Expansion, percent



Thermal linear expansion -- Nickel + Manganese + Σx_j

Thermal Linear Expansion, percent

ACTION STREET,

Thermal linear expansion -- Nickel + manganese + Σx_j

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Котагки	Cust, hot rolled to 0.75 in. diameter, ecoledin air; first heating.	The above specimen, cooling.	Same as above; second heating.	Drawn to wire.	X-ray diffmation method.
Sample Specifications	Haskins alloy 667; 94, 5 Ni, 3, 9 Mn, 0, 81 Si, and 0, 04 C.	Sume an above.	Same as above.	Manganose nickel; 97.0 Nf, 1.6 Mn, 0.8 Fe, and 0.3 Cu.	Wire apecimen 9.000 in, dia by 0.157 in, long obtained from Driver-Harris Co., Harrison, N.J.; min 50 Ni, 0.35 Mn, 0.3 Fe, 0.2 Si, max 0.2 Cu, 0.15 C, and 0.008 S.
Rept. Error%					
Tomp. Itange ok	373-1273	373-1273	373-1273	470-1073	302-1366
Ref.	57-62	67-62	67-62	67-62	2 - 2 0 2 0 2 0 2 0 2 0 2 0 0 2 0 0 0 0
E ON	0	•	0	٥	D

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PROPERTIES OF NICKEL + MOLYBDENUM + XX:

REPORTED VALUES

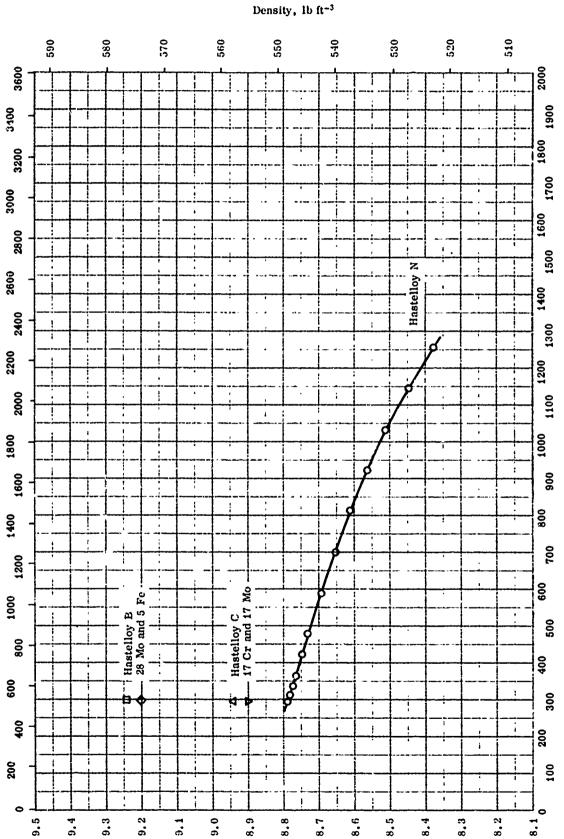
LCIB	m).	See light c	
Melt	ing Point:	ĸ	R
0	Hastelloy B	1693	3045
♥	30 Mo and 30 Cr	155.	2796
٥	22.5 No and 22.5 Cr	1563	2514

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PROPERTIES OF NICKEL + MOLYBDENUM + Σx_1

Remarks	M.P. depends upon material in contact with sampl	M.P. by visual observation of powder in graphite crucible.	Same as above.	
Sample Specifications	Hastelloy B; nominal composition: 66 Ni, 26-30 Mo, 4-7 Fe, 0.12 > C.	40 Ni, 30 Mo, and 30 Cr,	55 Ni, 22.5 Mo, and 22.5 Cr.	
Rept.				
Temp. Range oK	1693	1553	1563	
Ret.	53-19	55-28	55-28	
Sym fool	0	D	♦	





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Temperature, oR

DENSITY -- NICKEL + MOLYBDENUM + EX

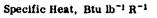
Temperature, oK

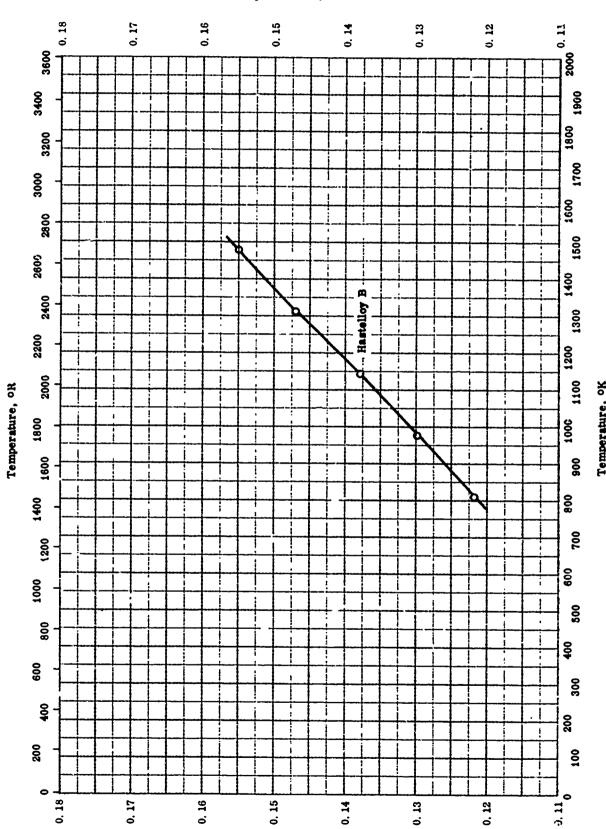
Density, g cm-3

Density -- nickel + molybdenum + ΣX_{j}

REFERENCE INFORMATION

Remarks					
Sample Specifications	Hastelloy N; 16.5 Mo, 7.0 Cr. 5.0 Fe, 0.9 Mn, 0.5 Si, 0.5 Al and Ti,0.06 C, and 0.01 B.	Hastelloy B; nominal composition: 66 Ni, 26-30 Mo, 4-7 Fe, and 0.12 > C.	Hastelloy C (AMS-5530); 16-18 Mo, 15.5-17.5 Cr, 4.5-7.0 Fe, 3.75-5.25 W, and 0.15 > C.	52 Ni, 17 Cr, 17 Mo, 6 Fe, 4.5 W, 2.5 > Co, 1.0 > Mn, 1.0 > Si, 0.4 V, and 0.15 > C.	62 Ni, 28 Mo, 5 Fe, 2.5 ≥ Co, 1.0 ≥ Mn, 1.0 ≥ Si, 0.5 V, and 0.12 ≥ C.
Rept. Error %					
Temp. Range ^o K	294-1255	298	598	298	298
Ref.	62-5	50-3	50-3 also 47-2	60-15	60-15
Sym	0	0	٥	Þ	♦





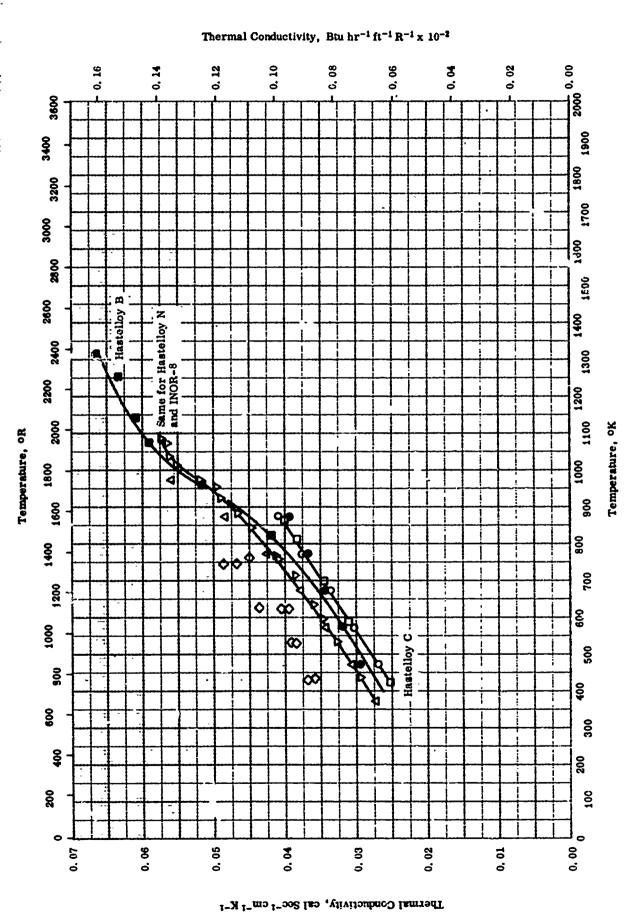
SPECIFIC HEAT -- NICKEL + MOLYBDENUM + XX

Specific Heat, cal g-1 K-1

SPECIFIC HEAT -- NICKEL + MOLYBDENUM + $\Sigma X_{\mathbf{i}}$

П	
Remarks	
Sample Specifications	Hastelle, B; composition before test: 65.57 Ni, 23.78 Mo, 5.05 Fe, and 0.020 C, and after test: 65.55 Ni, 24.00 Mo, 4.96 Fe, and 0.023 C; density 585.5 lb ft ⁻³ .
Rept.	o ë
Temp. Range ok	784-1375
Ref.	3. 3.
E S	0





THERMAL CONDUCTIVITY -- NICKEL + MOLYBDENUM + EX

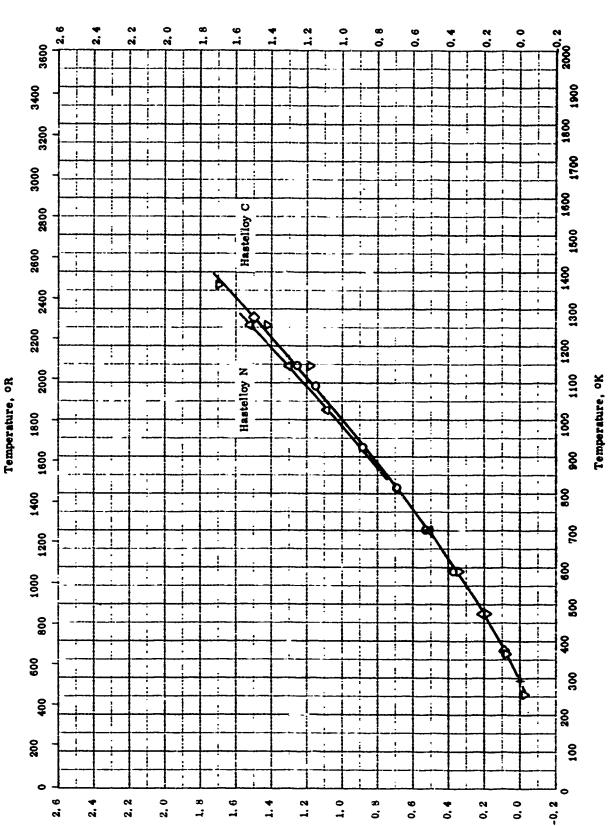
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THERMAL CONDUCTIVITY -- NICKEL + MOLYBDENUM + EX

Remarks				Prepared from a hot forged bar indentified by Westinghouse as heat MI669-4.			Precipitation of Ni ₄ Nio phase as particles between and within the grains.	
Sample Specifications	Hustelloy C (AMS-5630); 16-18, 1 Mo, 15, 5-17, 5 Cr, 4, 5-7, 0 Fo, 3, 75-5, 25 W, and 0, 15 max C; density 558 lb ft ⁻³ .	Hastelloy C; 16 Mo, 15, 5 Cr, 5, 5 Fe, 3, 7 W, 2, 5 Co, 0, 35 V, and 0, 08 max C.	Hustelloy N; 16.5 Mo, 7 Cr, 5 Fe, 0.8 Mn, 0.5 Si, 0.5 Al + Ti, 0.06 C, and 0.01 B.	INOR-8; 71.1 NI, 16, 2 Mo, 7.25 Cr, 4.60 Fe, 0.36 Mn, 0.34 Si, Prepared from a hot forged bar indentified by 0.22 AI, 0.17 W, 0.10 Ti, 0.084 C, 0.006 S, and 0.003 P. Westinghouse as heat M1669-4.	Inok-8; composition not given.	Hastelloy B; 26-30 Mo, 4-7 Fe, and 0, 12 max C; density 577 B ft ⁻³ ,	Hustelloy B; composition before test; 65, 57 Ni, 23, 78 Mo, 5, 05 Fe, and 0, 020 C, and after test; 65, 55 Ni, 24, 00 Mo, 4, 96 Fe, and 0, 023 C; density 585, 5 lb ft ⁻³ .	
Rept. Error%				# T				
Temp. Runge ^o K	473-873	422-866	372-972	439~1090	431-761	472-872	822-1319	
Ref,	47-2	58-12	62-5	62-9	607	20 - :3	2) 1 X 20	
Sym	0	0	٥	D	\rightarrow	•	•	



Thermal Linear Expansion, percent



THERMAL LINEAR EXPANSION -- NICKEL + MOLYBDENUM + Σx_1 (15 - 18 Mo and 6 - 17.5 Cr)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- NICKEL + MOLYBDENUM + ΣX_1 (15 - 18 Mo and 6 - 17.5 Cr)

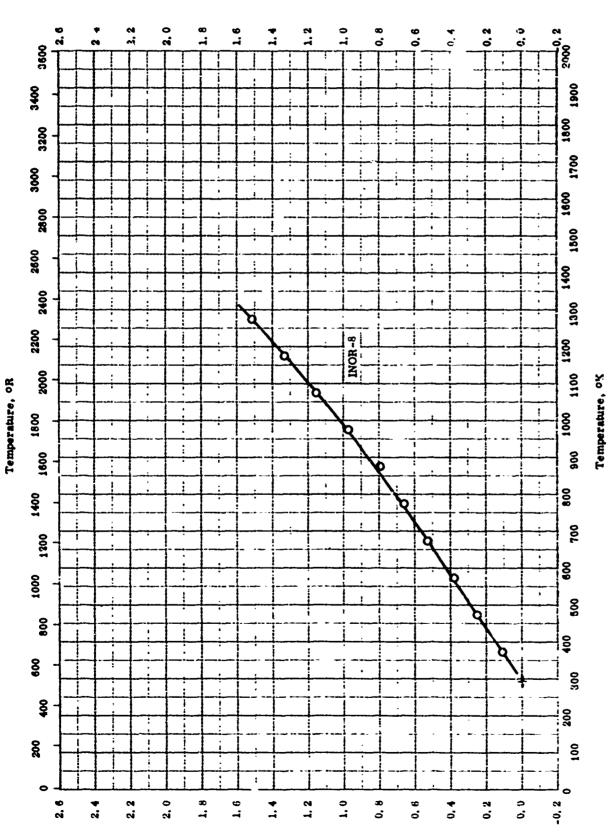
REFERENCE INFORMATION

Remarks	Average data of wrought and cast forms of alloy.	Samo as above.		
Sample Specifications	Hastelloy C; 47, 16 - 58,50 Ni, 15,00 - 18,00 Mo, 14,50 - 17.50 Average data of wrought and cast forms of alloy. Cr, 4,00 - 7,00 Fe, 3,00 - 5,25 W, 2,50 Co, 1,00 Si, 1,00 Mn, 0,08 - 0,12 C, 0,20 - 0,40 V, 0,04 P, and 0,03 S; density £,94 g cm ⁻³ and M. P. 1265 - 1343 C; electrical resistivity 130 microhm-cm at 24 C.	Same as above.	Hastelloy N; 65, 52 - 70, 57 Ni, 15, 00 - 18, 00 Mo, 6, 00 - 8, 00 Cr, 5, 00 Fo, 1, 00 Si, 0, 80 Mn, 0, 50 (Al + Ti), 0, 50 W, 0, 35 Cu, 0, 20 Co, 0, 04 - 0, 08 C, 0, 020 S, 0, 015 P, and 0, 010 B; density 8, 93 g cm ⁻³ and M, P, 1300 - 1400 C.	Hastelloy C (AMS - 5530); nominal: 16.0 - 18.0 Mo, 15.5 - 17.7 Cr 4.5 - 7.0 Fe, 3.75 - 5.25 W, and 0.15 max C; density 558 lb ft ⁻³ .
Rept. Error%				
Temp. Range og	294-1144	273-1273	294-1265	256-1367
Ref.	63-26	63-26	66-3	90-3
Sym	0	\Q	٥	D



THERMAL LINEAR EXPANSION -- NICKEL + MOLYBDENUM + EX. (16.9 Mo and 6.86 Cu)

Thermal Linear Expansion, percent



Thermal Linear Expension, percent

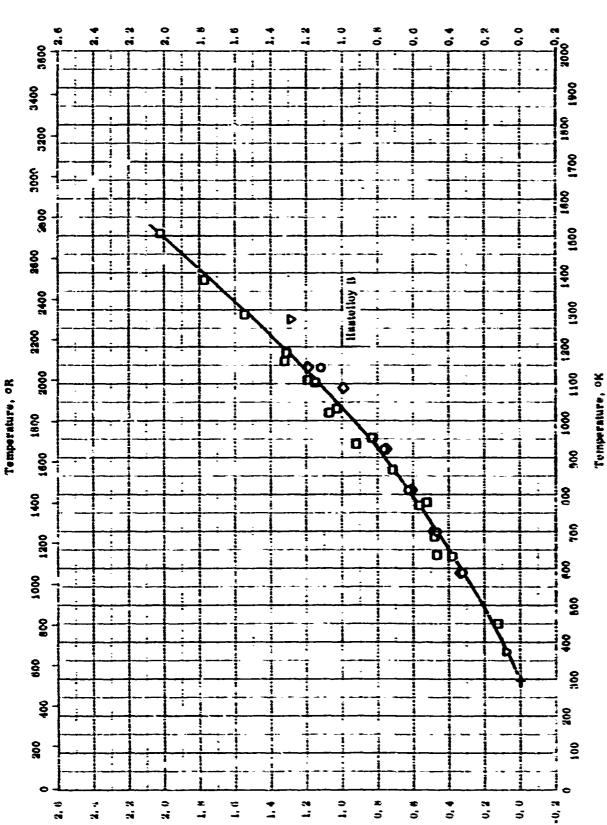
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THERMAL LINEAR EXPANSION -- NICKEL + MOLYBDENUM + $\Sigma X_{\rm i}$ (16. 5 mo and 6. 86 Cu)

Ветиткя	
Sample Specifications	INOR-8; 16.90 Mo, 6.86 Cu, 4.21 Fe, 0.84 Mn, 0.23 Si, and 0.14 C.
Kept. Error%	-
Tomp.	373-1272
Ref.	85 19
E SYL	0



Thermal Linear Expension, percent



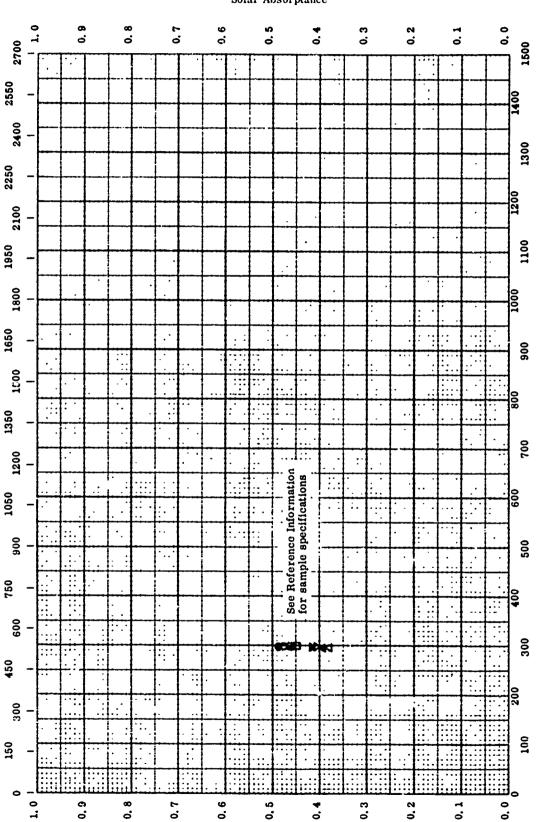
THERMAL LINEAR EXPANSION -- NICKEL + MOLYBDENOM · EX. (28, * - 80 Mc and 4 - 7 Pc)

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THERMAL LINEAR EXPANSION -- NICKEL + MOLYBDENUM + ΣX_i (23, 8 - 30 Mo and 4 - 7 Fe)

Remarks					
Sumple Specifications	Hastelloy Alloy B; nominal: 26.0 - 30.0 Mo, 4.0 - 7.0 Fe, and 0.12 max C; density 577 lb ft ⁻³ .	Hastelloy B; before test: 65.57 Ni. 23.78 Mo, 5.05 Fe, 0.020 C; after test: 65.55 Ni, 24.00 Mo, 4.96 Fe, and 9.023 C; density 585.5 lb ft ⁻³ .	Hastelloy B; nominal: 26.00 - 30.00 Mo, 4.00 - 7.00 Fe, 2.5 Co, 1 Cr, Si, Mn each, 0.05 C, 0.2 - 0.6 V, 0.04 P, and 0.03 S; density 9.24 g cm ⁻³ and M. P. 1320 - 1350 C; electrical resistivity 135.0 microhm-cm at 24 C.	Same as above.	
Rept. Error %					
Temp. Range ^O K	589-1145	300-1503	294-1144	273-1273	
Ref.	50-3	58-2	60-21	60-21	
Sel a	0	Ω	♦	D	

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Temperature, ^oR

Temperature, °K

SOLAR ABSORPTANCE -- NICKEL + MOLYBDENUM + ΣX_l

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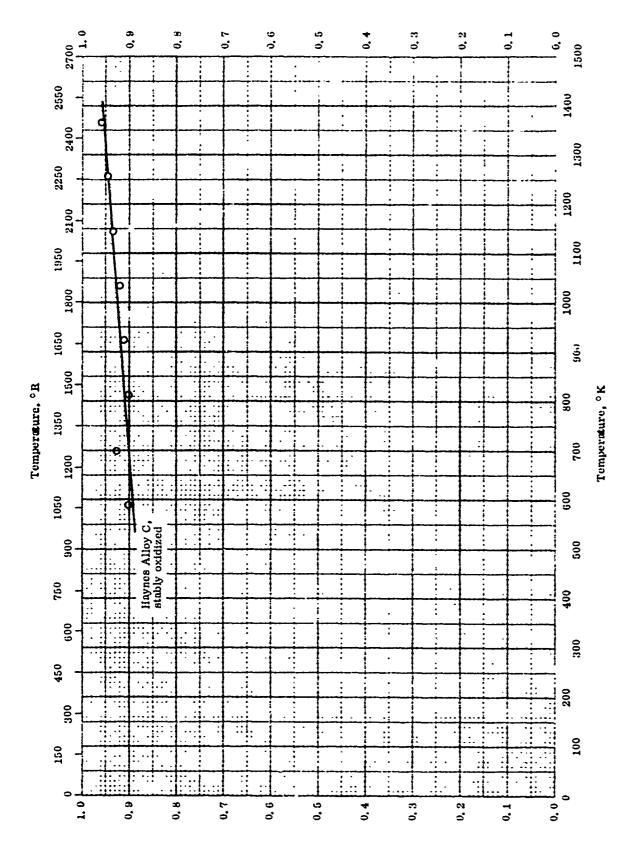
Solar Absorptance

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SOLAR ABSORPTANCE -- NICKEL + MOLYBDENUM + $\Sigma N_{\rm I}$

Remarks	Anncaled; above atmosphere.	The above specimen at sea level.	Annealed; above atmosphere.	The above specimen at sea level.	Annealed; above atmosphere,	The above specimen at sea level.	Annealed; above atmosphere.	The above specimen at sea level.	
Sample Specifications	Hastelloy B, nominal: 28 Mo, 5.5 Fe, 1 > Cr, 1 > Mn, 1 Si, and Annealed; above atmosphere. 0.12 C; aircruft grade; surface finish 15 \mu in. RMS,	Same as above.	Hastelloy B; aircraft grade; surface finish 2 μ in. RMS.	Same as above.	Hastelloy C, nominal: 17 Mo, 16.5 Cr, 6 Fe, 4 W, 1 Mn, 1 Sı, and 0, 15 max C; grade AMS 5530 C; surface finish 15 μ in. RMS.	Same as above.	Hastelloy C: grade AMS 5530 C; surface finish 2 µ in, RMS.	Same as above,	
Rept. Error %									
Temp. Range ^O K	80Z	20%	298	208	802	298	298	298	
Red.	57-48	37-48	37-48	57-48	57-48	57-48	57-48	57-48	
Sym	0	•	٥	•	0		Þ	•	

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HEMISPHERICAL TOTAL EMITTANCE -- NICKEL + MOLYBDENUM + 5X,

Hemispherical Total Emittance

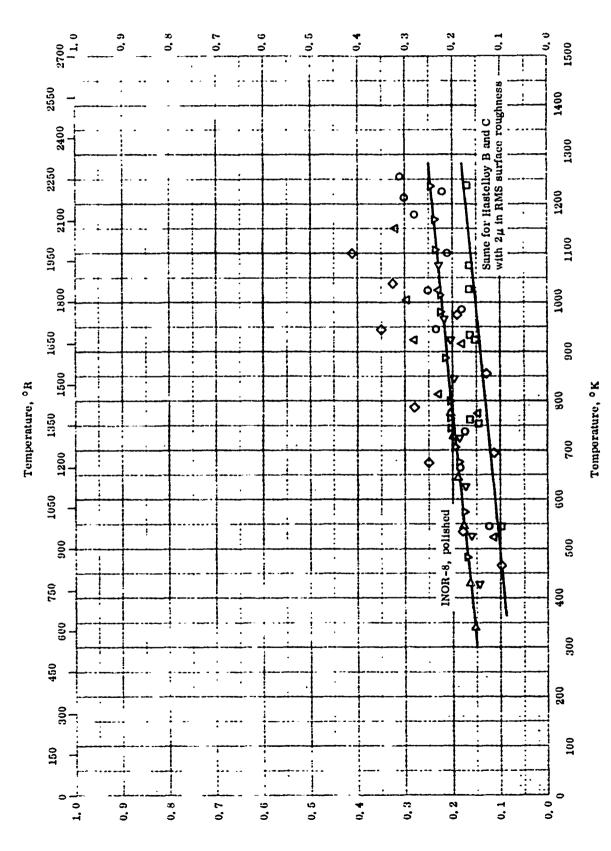
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HEMISPHERICAL TOTAL EMITTANCE -- NICKEL + MOLYBDENUM + ΣX_1

Remarks	Cleaned, polished, washed, and stably oxidized in air at 1366 K for 35 min.
Sample Specification	Haynes alloy C; nominal: 52 - 60 Mi, 16 - 18 Mo, 15.5 - 17.5 Cr, 4.5 - 7.0 Fe, 3.75 - 5.25 W, and 0.15 max. C.
Rept. Error %	
Temp. Range ^O K	5 MD-13G6
Ref.	59-17
Sym	0



NORMAL TOTAL EMITTANCE -- NICKEL + MOLYBDENUM + EX

Normal Total Emittance

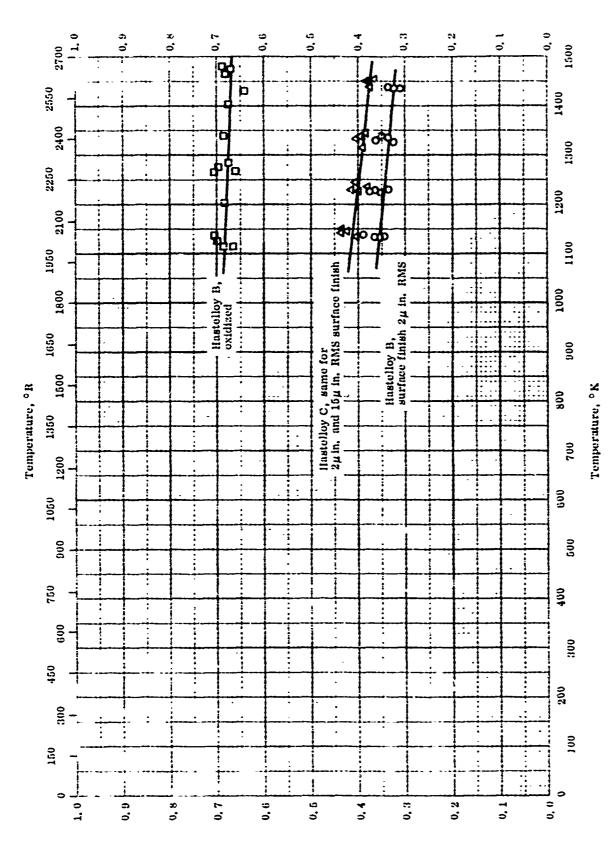
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NORMAL TOTAL EMITTANCE -- NICKEL + MOLYBDEN"M + Σx_1

REFERENCE INFORMATION

Remarks	Measured in a vacuum of 5 x 10° 4 mm Hg.	Measured in a vacuum of 5 x 10 ⁻⁴ mm Hg.	Measured in a va. 1um of 5x 10 ⁻⁴ mm lig.	Measured in a vacuum of 5x 10-4 mm Hg.	Rough hand-polished with 4-P metallograph:c paper, then polished with A and B alumina and finally polished with diamond paste; 5 x 10 ⁻⁶ mm Hg vacuum; heating,	The above specimen; cooling.	Polished; 5 x 10 ⁻⁶ mm Hg vacuam.		
Sample Specifications	Hustelloy B, norminal: 28 Mo, 5.5 Fe, 1 max. Cr, 1 max. Mn, 1 Si, and 0.12 C; aircraft grade; surface finish 15 u in. RMS.	Hastelloy B; aircraft grade; surface finish 2 µ in, RMS.	Hustelloy C, nominal: 17 Mo, 16.5 Cr, 6 Fe, 4 W, 1 Mn, 1 Si, and 0, 15 mux. C; grade AMS 5530 C; surface finish 15 μ in. RMS.	Hastelloy C, grade AMS 5530 C; surface finish 2 µ in. RMS.	INOR-8; 70 Ni, 17 Mo, 7 Cr, 5 Fe, 0,8 Mn, 0,05 Al + Ti, and 0,06 C.	Same as above.	Same as above; hollow cylinder with 1/32 in, wall thickness,		
Rept. Error %	1 10	t 10	10	± 10	12.7	±2.7	± 2.7		
Temp. Range OK		644-1239	522-1150	466-1100	481-1234	428-1072	340-776	_	
Ref.	57-48	57-48	57-48	57-48	63-20	63-20	63-20		
Sym	0	0	٥	٥	D	▽	Δ		

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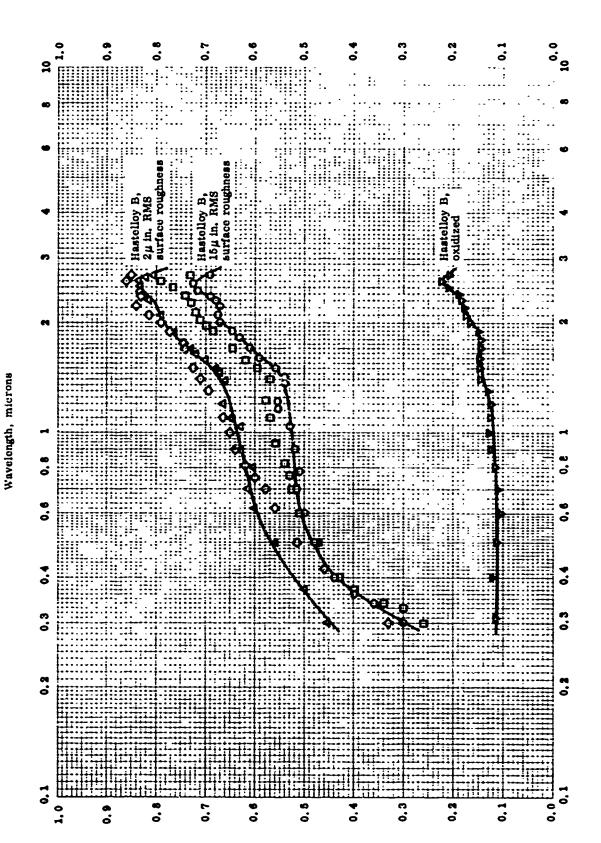


NORMAL SPECTRAL EMITTANCE -- NICKEL + MOLYBDENUM + EX

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NORMAL SPECTRAL EMITTANCE -- NICKEL + MOLYBDENUM + ΣN_1

Remarks	Mensured in vacuum.	Oxidized in air at red heat for 30 min.; measured in vacuum.	Measured in vacuum: same emittance vulue for 15 μ in. RMS surface finish.
Sample Specifications	Hustelloy B; nominal: 28 Mo, 5,5 Fe, 1 max. Cr, 1 max. Measured in vacuum. Mn, 1 Si, and 0, 12 C; alreraft grade; surface finish 2μ in, RMS,	Hastelloy B; afreraft grade; surface finish 2 μ in, RMS.	Наменю С: nombal: 17 Mo, 16, 5 Сг, 6 Fe, 4 W, 1 Mn, 1 Sl, and 0, 15 max. С: grade AMS 5530 С; surface finish 2 µ in, RMS.
Ropt. Error %			
Temp. o K	1133-1439	1114-1480	11:36-145:3
Wavelength	0. 665	0, 665	0.665
Raf.	67-48	57-48	4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4
# 18 20 20 20 20 20 20 20 20 20 20 20 20 20	0	0	٩



NORMAL SPECTRAL REFLECTANCE -- NICKEL + MOLYBDENUM + EX

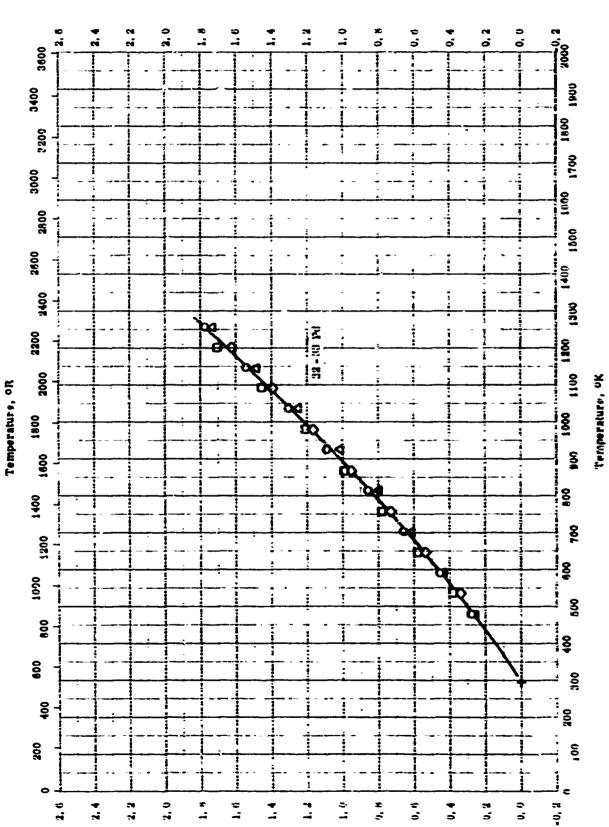
Normal Spectral Reflectance

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NORMAL SPECTRAL REFLECTANCE -- NICKEL + MOLYBDENUM + EN

Ronzarks	Anneatied,	Annealed.	Oxidized.	Annealed.	Annealed,
Sample Specifications	Hastelloy B, norainal: 28 Mo, 5,5 Fe, 1 max, Cr, 1 max. Mn, 1 Si and 0,12 C; alveraft grade; surface finish 15 \$\mu\$ in, RMS,	llustelloy B; afreruft grade; surface sinish 2 \mu in, RMS,	flustelloy B: nireruft grade.	Hastelloy C: nominal: 17 Mo, 16, 5 Cr., 6 Fe, 4 W, 1 Mn, 1 S1, 0, 15 mix. C: grade AMS 6530 C; surface finish 15 \mu in, RMS.	Hastelloy C: grade AMS 56:10 C: sarface flats 2 µ in. RMS.
Rept. %					
Wavelength Bunge, B	0,3-2,7	0, 3-2, 7	0,31-2,7	0.31-2,7	0, ng. 7
×					
Temp.	208	x 63	\$ 5°	**************************************	ž n
Ref.	67-48	57-48	02-80	2	8.4.8 8.4.8
37E	0	٥	>	c	⋄

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Thermal linear expansion -- Nickel + Palladium + Ex,

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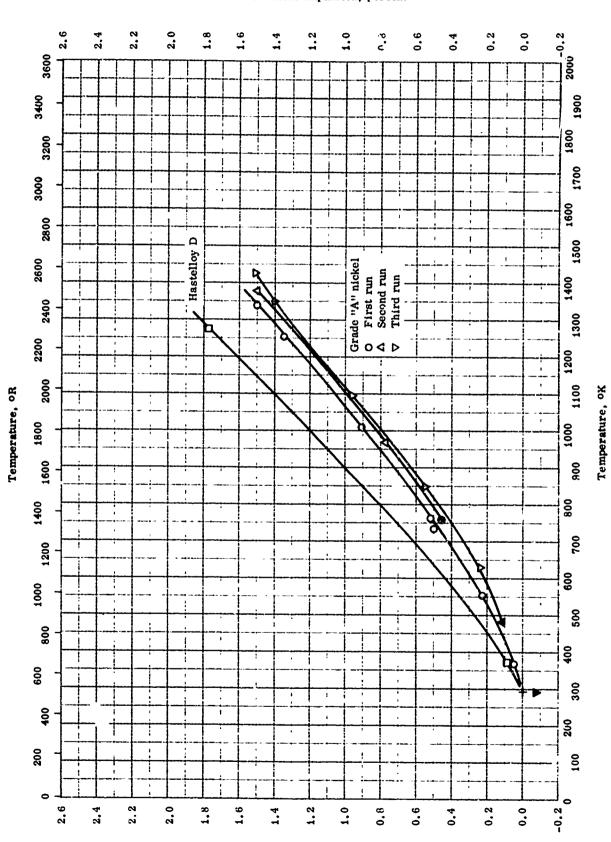
Thermal Lucest Expansion, percent

THERMAL LINEAR EXPANSION -- NICKEL + PALLADIUM + $\Sigma \mathrm{X}_{\mathrm{I}}$

REFERENCE INFORMATION

Remarks	As cast.	Same as above; then heat treated 24 hrs at 2000 F in argon.	As cast.	Same as a bove; heat treated 24 hrs at 2000 F in argon.
Sample Specifications	75 GE-76 brazing alloy and 25 Nichrome V; 44.75 N, 33 Pd, 22, 25 Cr, 0.04 Si, and 0.01 S.	Same as above,	50 Ge-76 hrazing alloy at. 50 Nichrome V; 56.5 Ni, 22 Pd; 21.5 Cr, 0.025 Si, and 0.007 S.	Same as above.
Rept. Error %	2 #	81 #I	41 C3	0 +
Temp.	478-1256	478 1256	478-1256	478-1255
Ret.	54-30	54-30	54-30	54-30
Sym	0	0	٥	⋄

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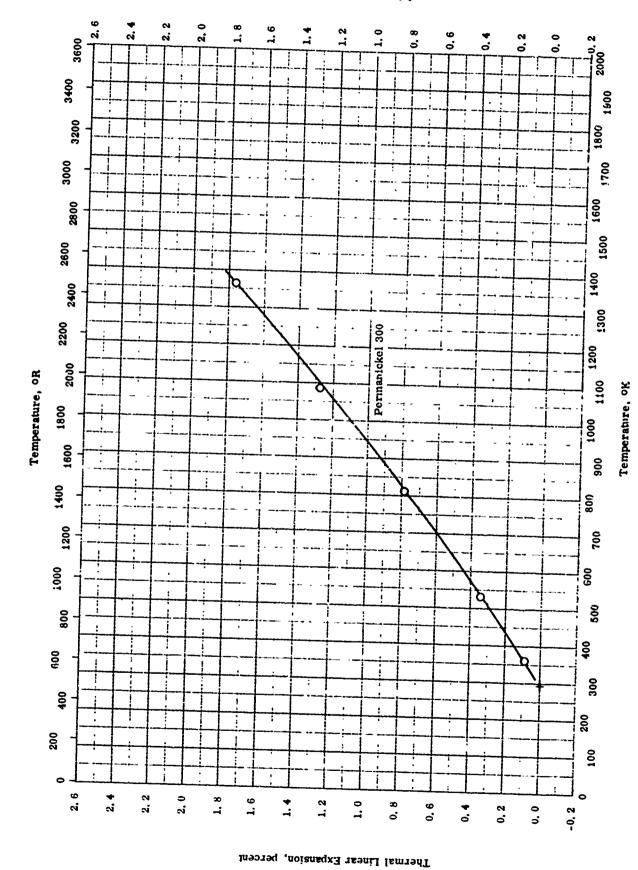
THERMAL LINEAR EXPAN'ION ... NICKEL +SILICON + 5X,

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- NICKEL + SILICON + Σx_1

Remarks	Sand cast.	Cold rolled from melt; measured in argon.	Cooling data of above specimen.	Re-heating of above specimen,	Cooling data of above specimen.	Re-heating again.	Cooling data of above specimen.	
Sample Specifications	Hastelloy D; 80, 13 - 84, 38 Ni, 8, 50 - 10, 00 Si, 2, 00 - 4, 00 Cu, Sand cast. 2, 00 Fe, 1, 50 Co, 1, 00 Cr, 0, 30 - 1, 25 Mn, and 0, 12 C; density 7, 80 g cm ⁻³ , M. P. 1110 - 1120 C, and electrical resistivity 113, 6 microhm-cm at 24 C.	Grade "A"; J. M. Tully Metal and Supply Co.; 98, 18 Ni, 0.5 Si, Cold rolled from melt; measured in argon. 0.5 Fe, 0.35 Mn, 0.25 Cu, 0.2 C, and 3.02 S; density 546 Ib ft ⁻³ by vol displacement.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Rept. Error %		83	81	83	23	63	٠,	
Temp. Range ^O K	_	294-1339	1339-760	760-1377	1377-486	486-1422	1422-294	
Ref.	60-23	62-24	62-24	62-24	62-24	62-24	62-24	
Sym	0	0	•	◁	4	۵	•	



THERMAL LINEAR EXPANSION -- NICKEL + TITANIUM + $\Sigma x_{
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THERMAL LINEAR EXPANSION -- NICKEL + TITANIUM + Σx_i

REFERENCE INFORMATION

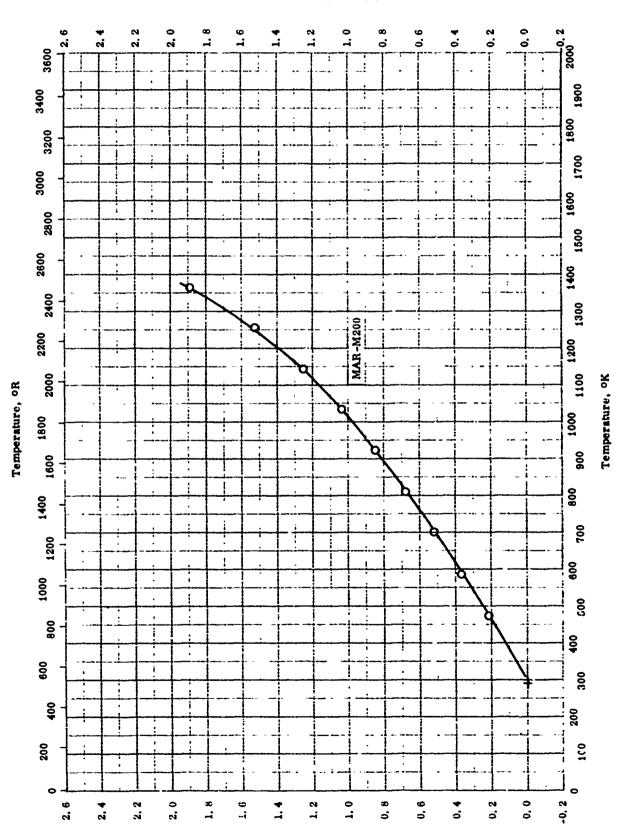
Remarks	
Sample Specifications	Permunickel Alioy 300; formerly"Permunickel Alloy" from International Nickel Co.; nominal; 98. 6 Ni, 0. 50 Ti, 0. 35 Mg, 0. 25 C, 5. 10 Fe, 0. 10 Mn, 0. 06 Si, 0. 02 Cu, and 0. 005 S; density 0. 316 lb In3
Rept. Error %	
Temp. Range ok	204-1367
Ref.	65-4
Sym	0

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THERMAL LINEAR EXPANSION -- NICKEL + TUNGSTEN + EX

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Therrial Linear Expansion, percent

THERMAL LINEAR EXPANSION -- NICKEL + TUNGSTEN + ΣX_{i}

REFERENCE INFORMATION

Remarks	As cust.
Sumple Specifications	MAR-M200 (former design SM200); bal Ni, 11.5 - 13, 5 W, 9.0 - 11.0 Co, 8, 0 - 10, 0 Cr, 4, 75 - 5, 25 Ai, 1, 75 - 2, 25 Ti, 0.75 - 1, 25 Nb, 1.5 max Fe, 0, 12 - 0, 17 C, 0, 03 - 0, 08 Zr, 0, 01 - 0, 02 B, and 0, 2 max M, Si euch; density 0, 304 lb in, -3 and M, P, 2400 - 2450 F.
Rept.	
Temp. Range oK	300-1367
Ref.	64-11
See .	0

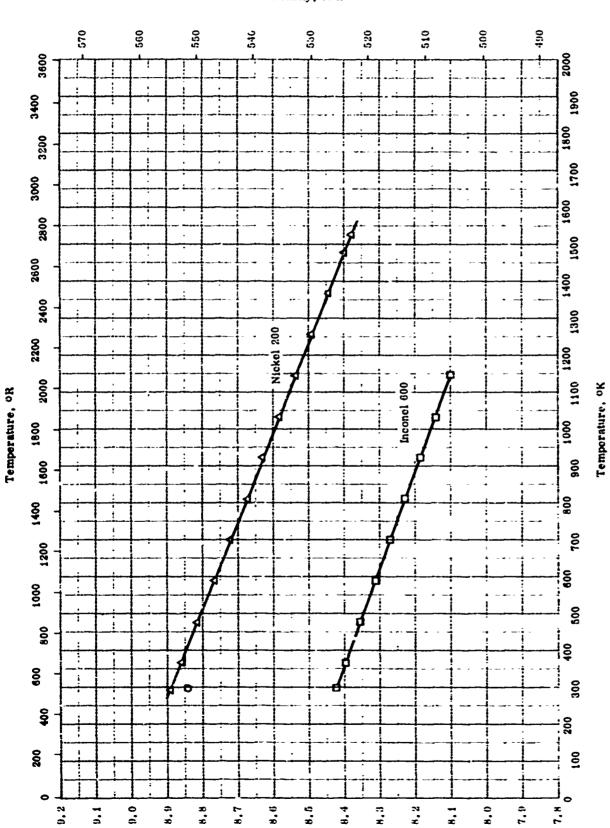


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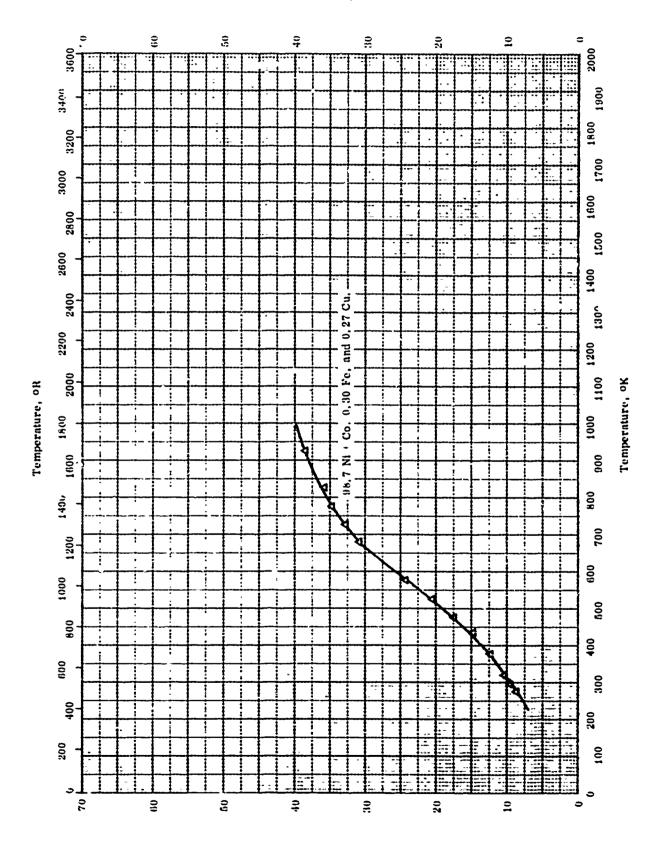




DENSITY -- NICKEL + EX

THE REAL PROPERTY OF THE PARTY
DENSITY --: NICKEL + EX

Remarks	Cast, rolled at 1150 C, annealed at 900 C, cold-drawn, and then annealed at 700 C.							
Sample Specifications	0, 14 SiO ₂ , and 0, 04 Si.	Incomed 600; 73, 55 NI + Co, 16 Cr, 7, 55 Fe, 2, 30 Nb + Ta, 0, 30 Si, 0, 2 Mn, 0, 04 C, 0, 03 Cu, and 0, 005 S,	Nickel 200 (Nickel A).					
Rept. Error%								
Temp, Range OK	803	300-1145	204-1627					
Ref.	55-18	62-7	62-17					
1.00	0	O	٥		 			



ELECTRICAL RESISTIVITY -- NICKEL + DX

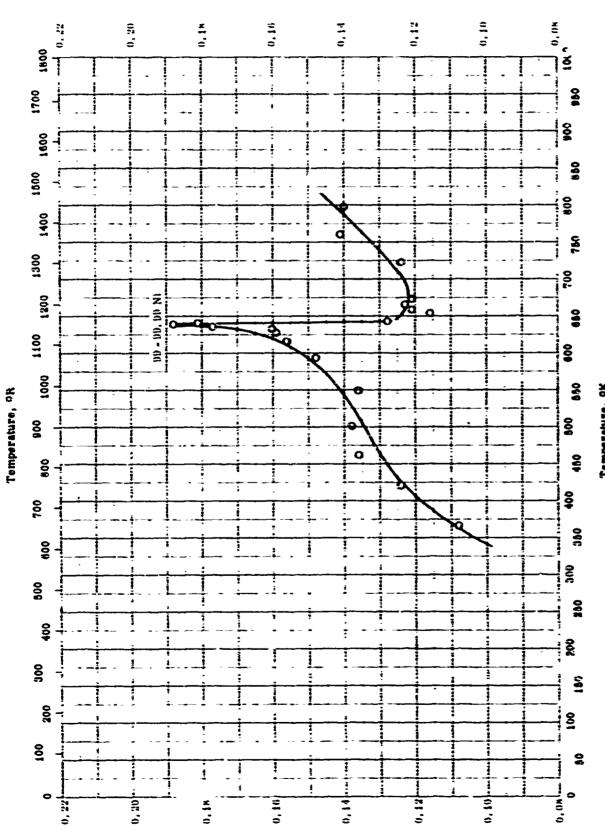
Electrical Resistivity, ohm cm z 10^6

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ELECTRICAL RESISTIVITY -- NICKEL | SN

		 		_
Remarks	Cast, rolled at 1150 C, annealed at 900 C, and then cold-drawn, final annealed at 700 C.			
Sample Specifications	08,70 Ni · Co, 0,30 Fe, 0,27 Mn, 0,20 Cu, 0,18 Mg, 0,17 C, 0,14 RiO ₂ , and 0,04 S,			
Rept.		 		
Temp.				
Rof.	pp-1×	 -		
Sym	٥			

SPECIFIC REAT .. NICKEL . EN,



Specific Heat, cal x-1 K-1

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SPECIFIC HEAT -- NICKEL + ΣX_1

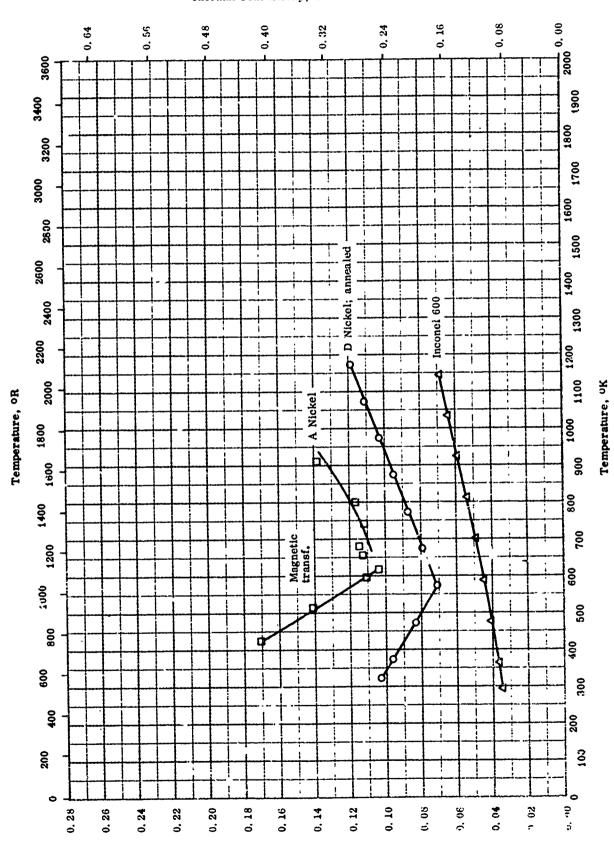
REFERENCE INFORMATION

Remarks								
Sample Specifications	0.01-1.0 Co, Cu, Fe, and Mr.							
Rept. Error %								
Temp. Sange ^O K	367-797		- , -					
Ref.	55-19	·				 		
Evan Boll	0				 -	 	 	

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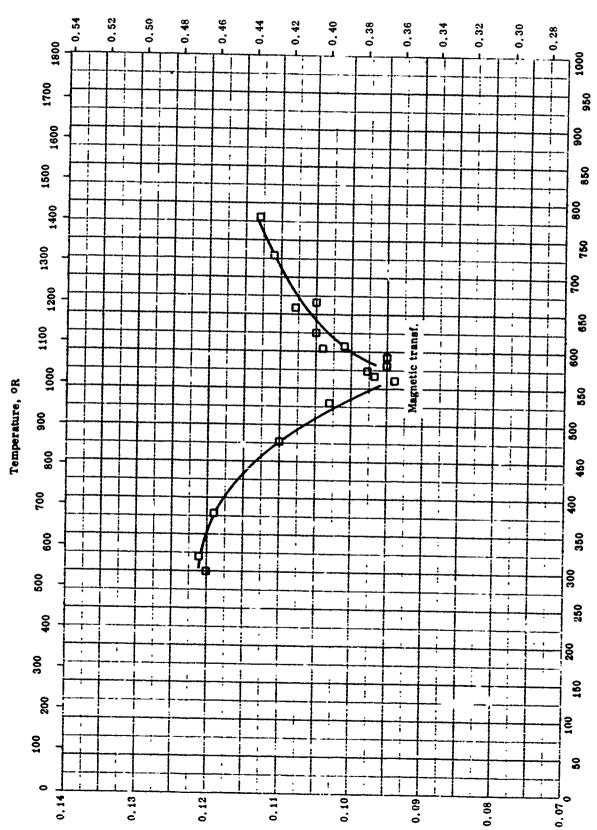


THERMAL CONDUCTIVITY --- NICKEL + ΣX_i

Thermal Conductivity, cal Sec-1 cm-1 K-1

THEAMAL CONDUCTIVITY -- NICKEL + EX

Remarks	Annealed at 900 C.			
Sample Specifications	D Nickel; 92.79 Ni, 4.35 Mn, 1.35 Fe, 1.27 Co, 0.158 C and n. 06 Si.	A Nickel; 89. 542 Ni, 0.3 Sl, 0.25 Mn, 0.2 Ti, 0.068 Fc, 0.034 Co, 0.034 Mg, and traces of Cu, Al, B, Ca, and Cr.	Inconel 60¢ 73, 5£ N1 + Co, 16 Cr, 7. 55 Fe, 2. 30 ND + Ta, 0.3 31, 0.2 Mn, 0.04 C, 0.03 Cu, and 0.005 S.	
Rept.	83	5-19		
Temp. Range ok	1	422-910	294-1144	
Ref.	53-2	2- 	62-7	
Sym	0	0	٥	



THERMAL DIFFUSIVITY -- NICKEL + Σx_1

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Thermal diffusivity, cm2 Sec-1

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THERMAL DIFFUSIVITY -- NICKEL $+\Sigma X_{\mathbf{l}}$

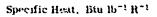
REFERENCE INFORMATION

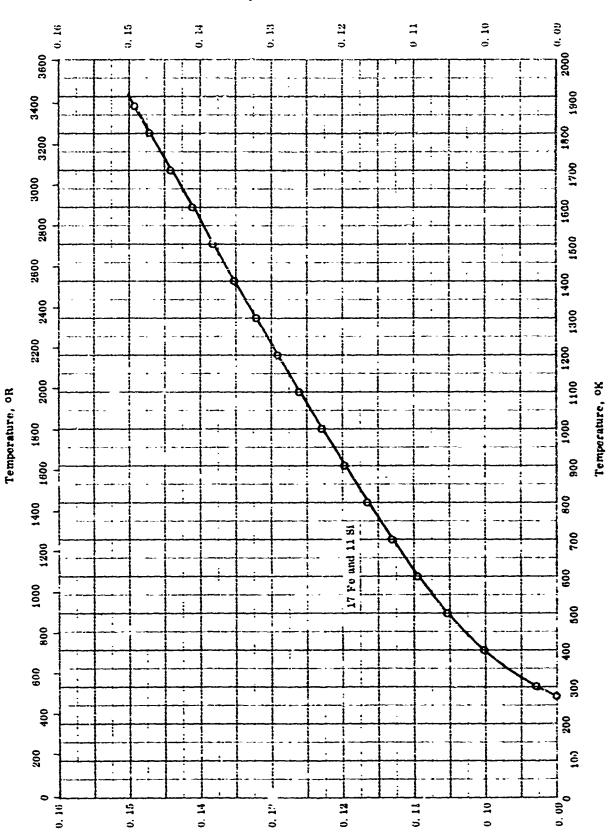
Remarks	
Sample Specifications	97. 92 Ni, Mn and Si mujo: impurities, and trace Co, Fe, and Mg; by spectrographic analysis.
Rept.	
Temp.	
Ref.	63-1
E S	D

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THE REPORT OF THE PROPERTY OF





SPECIFIC HEAT -- NICHUM + IRON + EX

Specific Heat, cal g"1 K";

The state of the s

SPECIFIC HEAT -- MOBIUM + IRON + EX

Romarks	
Sample Specifications	Ferroniobium; 58, 56 Nb, 17, 99 Fe, 10, 91 St, 7, 41 Ti, 3, 34 Al, 1, 17 Zr, 0, 63 Cr, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 63 Cr, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 63 Cr, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 63 Cr, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 63 Cr, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 63 Cr, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 63 Cr, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 042 P, 0, 042 P, 0, 042 P, 0, 011 Cu, and 0, 011 S, 1, 17 Zr, 0, 042 P, 0, 0
Rept.	
Temp.	
Nef.	01-10
Sym	0

Properties of Niobium - Molybdenum - ΣX_{i}

REPORTED VALUES

Den	sity	g cm ⁻¹	16 ft-	
0	10 Mo and 10 Ti	7, 25	453	
0	20 Mo and 10 T:	7.37	460	
Δ	30 Mo and 10 Ti	7.55	471	
⊽	20 Mo and 20 Ti	6.85	425	
\Diamond	40 Mo and 10 Ti	7.35	459	
•	30 Mo and 20 Ti	6.90	431	
	40 Mo and 20 Ti	6.80	425	
•	30 Mo and 30 Ti	6.50	406	

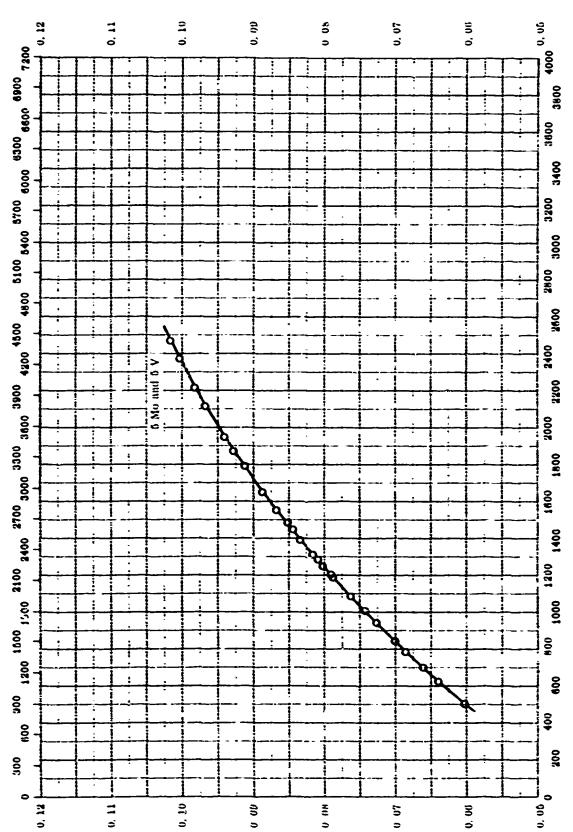
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PROPERTIES OF MOBIUM + MOLY IDENUM + EX

Remarks	Pressed at 4 ton cm ⁻² from powders, vacuum buked 5 hrs each at 46°C,600 C, and 90C C, 55 hrs at 100-1800 C; value 5-7° lower than theoretical.	Same an abye.	Same as above.	Sume as above.	Same as above.	Same as above.	Same as above.	Sume as above.	
Mample Specifications	80 Nb, 10 Mc, and 10 Tl; prepared from 58.9 Nb (1.0 Tc, 0.05 Tl, 0.03 S, 0.02 C, and 0.01 Fc) v0.9 Mo, and 90.5 Tl (0.1 Nf, 0.058 N2, 0.042 Sf, and 0.04 C).	70 Nb, 20 Mo, and 10 Tl; name an above.	60 Nb, 30 Mo, and 10 Tt; same as above.	60 Nb, 20 Mr, and 20 Tr; same as above.	50 Nb, 40 Mo, and 10 Tr; same as above.	60 Nb, 30 Mo, and 20 Tr; same as above.	40 Nb, 40 Mo, and 20 Tr; same as above.	40 NS, 30 Mo, and 30 Tl; same as above.	
Rept.									
Tem5. flange OK	2008	208	¥02	807	208	208	202	203	
Re f.	77 77 78	22-KQ	25-40	22-40	08.22	58-22	58-22	58 - 22	
	0	۵	٥	D	¢	•	•	◀	



Temperature, OR

SPECIFIC HEAT -- NIOBIUM + MOLYBDENUM + EX

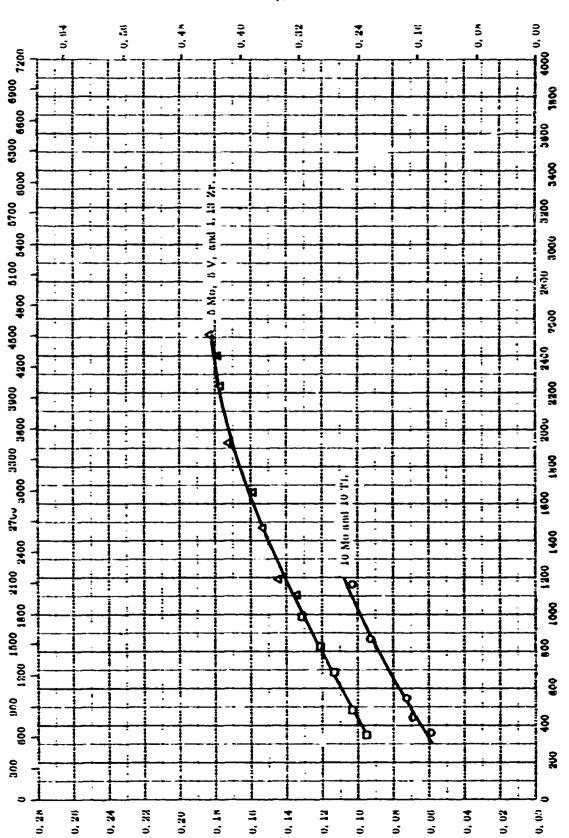
Temperature, UK

Specific Heat, cal g-1 K-1

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SPECIFIC HEAT - NOBIUM - MOLYBDENUM - EX

Nemarka	
Sample Specifications	Cb-DMo-DV-1Zr allog, 6, 03 Mo, 6, 02 V, 1, 13 Zr, 0, 0240 C, 0, 0130 N _p , and 0, 0001 O _p ; density fils lb ft ⁻³ .
Rrept.	ວ ປ່
Tamp.	
He 1.	T - 55
55. 26.	0



Temperature, on

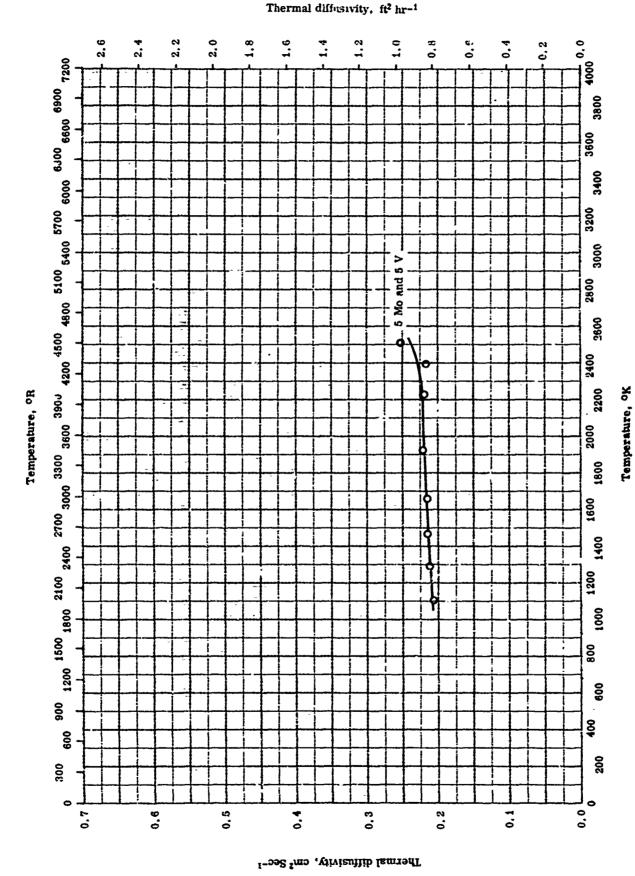
THERMAL CONDUCTIVITY -- NICHUM - MOLYBBENUM - I'N,

Temperature, ox

Persol Contentity, cai Sec 1 cm $^{-1}K^{-1}$

Thermal conductivity -- nobium + molybdenum + $\Sigma X_{\underline{1}}$

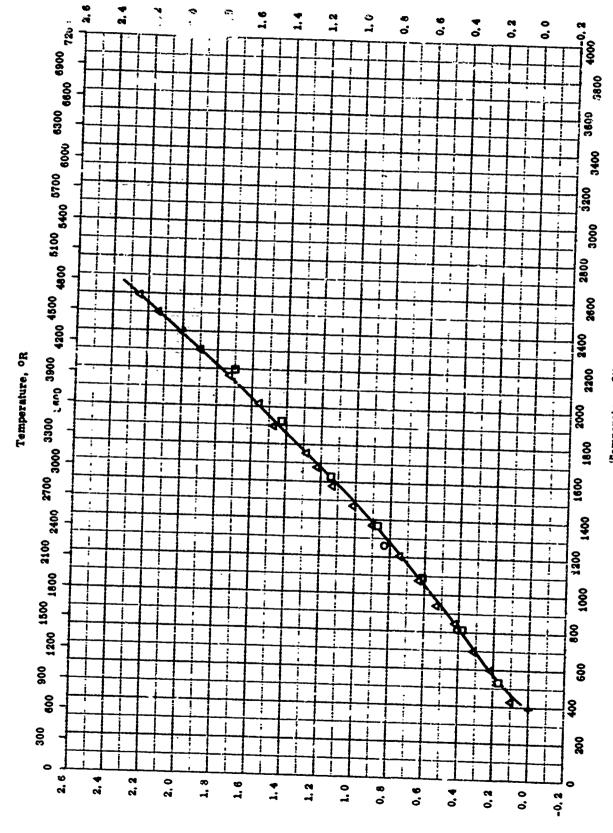
Remarks		and End-ground flat and parallel; measured in He atm.	The above sample measured by another method.	
Sample Specifications	10 Mo and 10 Ti; nominal composition	88,77 Nb, 5.03 Mo, 5.02 V, 1.13 Zr, 0.028 C, 0.0136 N ₂ , and 0.0093 C ₂ ; density 538 1b ft ⁻³ .	Same us above.	
Rept. Error%		4.	4.	
Temp.	361-1161	353-983	1103-2508	
Ref.	2-69	63-1	63-1	
Sym	0	0	٥	



Thermal diffusivity -- Niobium + molybdenum + Σx_i

Thermal diffusivity -- niobium + molybdenum + $\Sigma x_{\mathbf{i}}$

Remarks	Surface ground discs.
Sample Specifications	Nb-5 Mo-5 V-1 Zr; 5.03 Mo, 5.02 V, 1, 13 Zr, 0.0280 C, 0.0136 N _r , and 0.0093 O ₂ ; density 8.61 g cm ⁻³ .
Rept. Error%	
Temp. Range ^o K	1103-2510
Ref.	63-1
H TO SS	o



Thermal linear expansion -- Nicbium + Molybdenum + Σx_i

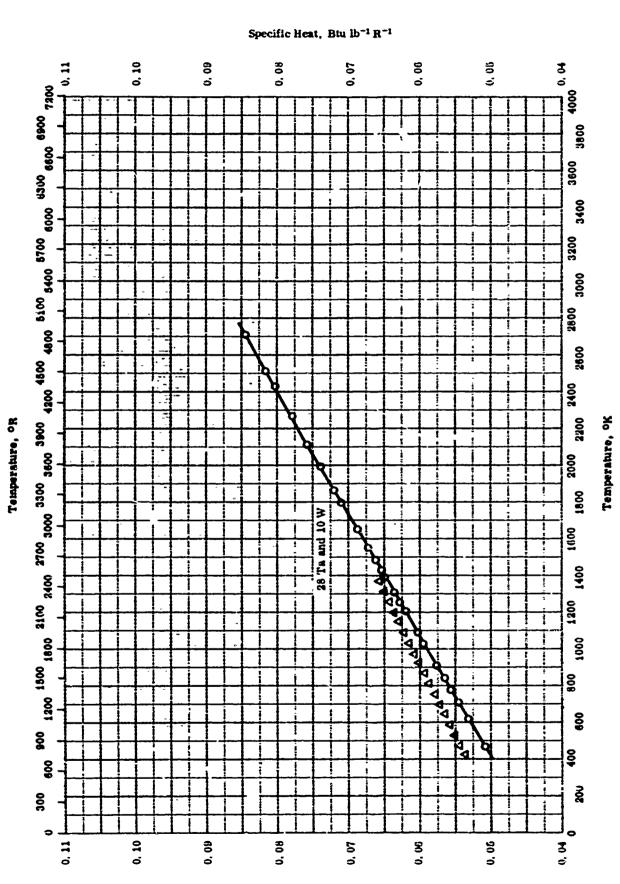
Thermal Linuar Expansion, percent

Thermal linear expansion -- niobium + molybdenum + Σx_1

Remarks	Drabte are-melted in vacuum by E.I. do Pont do Numeurs and Co., extruded in air and in argon to 2400-2500 F, recrystallized at 2300 F for 1 hr in an inert atm, and then machined into 3/8 in. cla by 3 in. long specimen by Thempson Preducts Incorporated.		Monsured in urgon with houting rate of approx 6 F min-1.
Sumple Specifications	10 Mo and 10 Tl.	B-68 niconum-buse, ., neminal: 6, 0 Mo, 5, 0 V, 1, 0 Zr, 0, 012 O, 0, 006 C and 0, 006 N, density 0, 305 lb in; 2 and M. P. 4300 F.	Wostinghouse Electric Corp, 88, 77 Nb, 5, 03 Me, 6, 02 V, 1, 13 Zr, 0, 028 C, 0, 0136 N and 0, 0093 O, density 538 lb ft ⁻³ ; specimen dimension 1/2 in. dia by 6 in. long.
Rept. Error%	ည V		æ
Tump. Range ok	300-1633	208-2198	300-2586
Ref.	60-18	97-36	63-1
Sym fool	0	0	٥



SPECIFIC HEAT -- NIOBIUM + TANTALUM + EX



Specific Heat, cal g⁻¹ K⁻¹

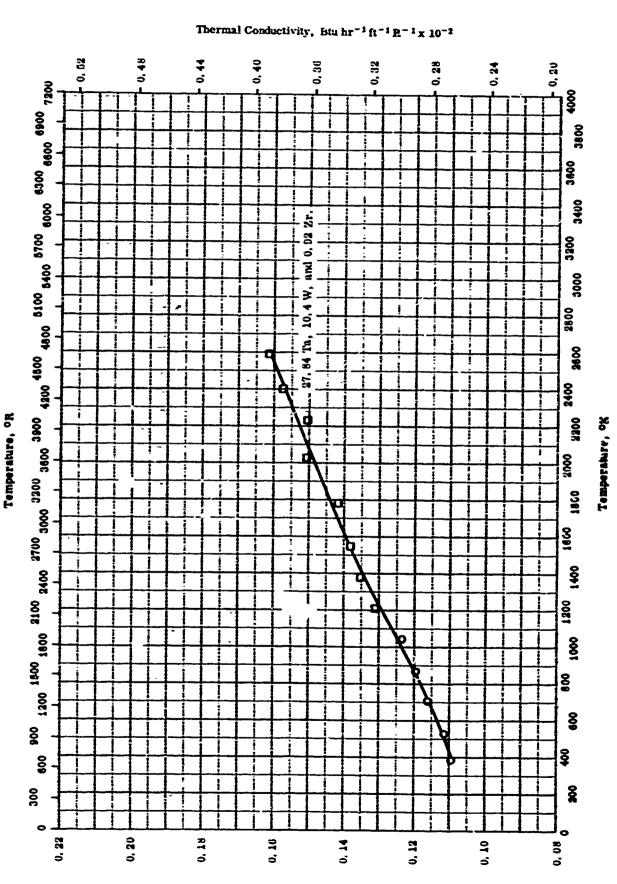
SPECIFIC HEAT -- NIOBIUM + TANTALUM + EX

Remarks		
Sample Specifications	Cb-27Ta-12W-0. 6Zr alby; 27. 84 Ta, 10. 40 W, 0. 92 Zr, 0. 01 Si, 0. 009 Ni, 0. 007 Fo, 0. 005 Ti, 0. 0050 O ₂ , 0. 0040 C, and 0. 0020 N ₂ ; density d69 lb ft ⁻³ . FS-82B alloy; 33 Ta and 0. 7-1. 0 Zr.	
Rept.	# p. 0	
Temp, Rept.	422-1364	
Ref,	61-20	
E S	8 0 4	



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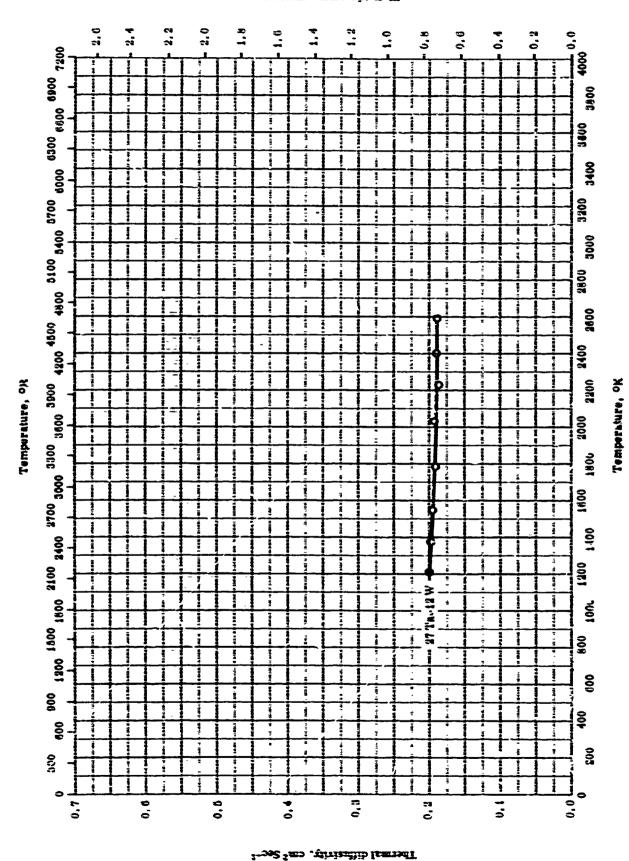
THERMAL CONDUCTIVITY -- NIOBIUM + TANTALUM + EX



Thermal Conductivity, cal Section IK.

THERMAL CONDUCTIVITY -- NIOBIUM + TANTALUM - TX

Remarks	1 81, 0.000 Ni, 0.007 End-ground flat and parallel; measured in Ne atm.	The above sample measured by another method,		
Rample Realfleations	00.8 Nb, 27.84 Ta, 10.40 W, 0.04 Zr, 0.01 81, 0.000 Ni, 0.007 Fe, 0.006 Ti, 0.0050 Oj, 0.0040 C, and 0.0020 Nj; density 060 Ib ft-3.	Antic us abive.		
Rept.	7	÷		
Temp.	386.1044	1308-2003		
Nof.	1-69	1-09		
52	0	0		



Thermal diffusivy -- Nichom + Tantalum + TX,

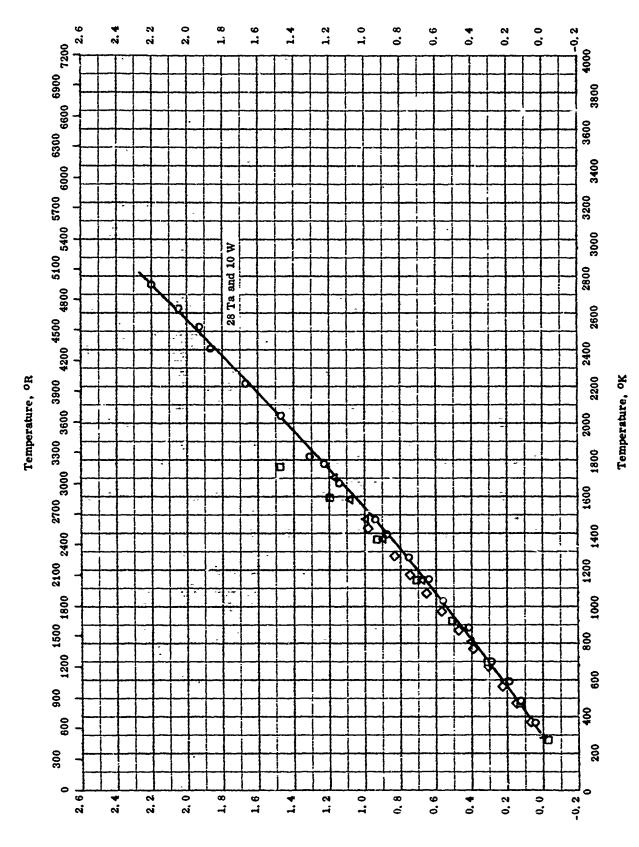
THERMAL DIFFUSIVITY -- !.!OBIUM + TAN. 'ALUM + \(\Sigma \).

REFERENCE INFORMATION

Revarks	· •
Sample Specifications	Nb-27 Ta-12 W-0. 5 Zr; 27. 84 Ta, 10. 40 W, 0. 92 Zr. 0.01 Si, 0.009 Ni, 0.007 Fe, 0.005 Ti, 0.0050 O ₂ , 0.0040 C, and 0.0020 N ₂ ; density 10. 72 g cm ⁻³ .
Rept. Error%	
Temp. Range ok	12082594
Ref.	63-1
E io	n

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THERMAL LINEAR EXPANSION -- NIOBIUM + TANTALUM + EX



Thermal Linear Expansion, percent

Thermal linear expansion -- niobium + tantalum + Σx_i

REFERENCE INFORMATION

Sym Ref. Ra	0 63-1	ND-1	Δ 61-27 2	61-20 2		
Temp. Range ^O K	300-2747	273-1761	297-1700	298-1423		
Rept. Error%	a					
Sample Specifications	Fansteel Metallurgical Corp.; 60.8 Nb, 27.84 Ta, 10.40 W, 0.92 Zr, 0.01 Si, 0.009 Ni, 0.007 Fe, 0.005 Ti, 0.005 O, 0.004 C, and 0.002 N; density 669 lb ft ⁻³ ; specimen dimension 1/2 in. dia by 6 in. long.	FS 85; 26-29 Ta, 10-12 W, 0.6-1.1 Zr, 0.0300 max O, 0.0150 max N, 0.0100 max C, Fe, Si each, and 0.0010 max H; density 10.6 g cm ⁻² and melting point 4695 F.	FS 82; 0.040 gage alloy sheet obtained from Fansteel Metal- lurgical Corp.; 33 Ta and 0.7 Zr.	F8 62B.		
Remarks	Measured in argon atmosphere with heating rate of 5 F per min.		Stress relieved 1 hr at 1900 F.	Tested in argon.		

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PROPERTIES OF NIOBIUM + TITANIUM + $\Sigma X_{\frac{1}{2}}$

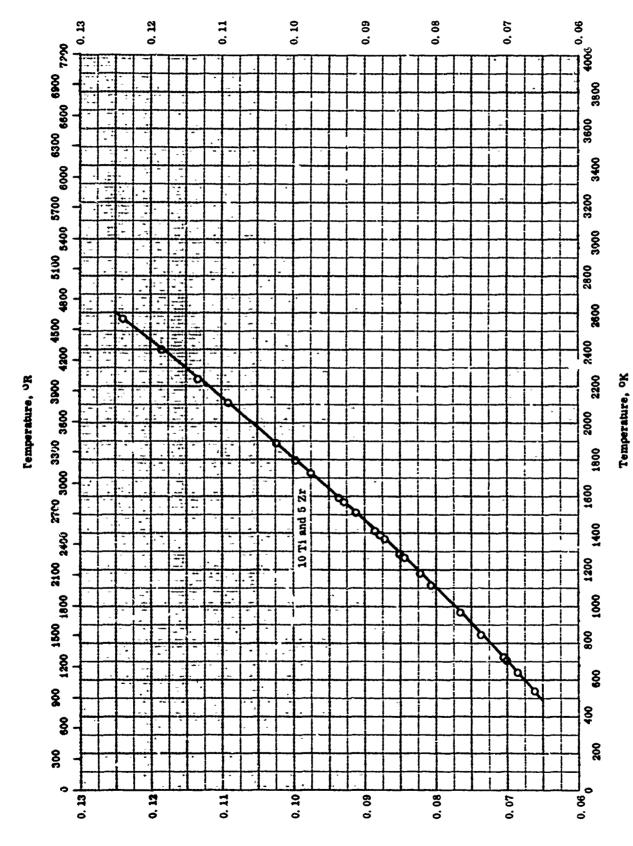
REPORTED VALUES

Dens	sity:	g cm ⁻³	lb ft ⁻³
0	10 Ti and 10 Mo	7.25	453
	20 Ti and 10 Mo	6.74	421
Δ	30 Ti and 10 Mo	6.12	352
⊽	20 Ti and 20 Mo	6.85	428
\Q	40 Ti and 10 Mo	5.12	320
•	30 Ti and 20 M	6.3	393
	40 Ti and 20 112	6.15	384
•	30 Ti and 30 M	6.50	406

PROPERTIES OF NIOBIUM + TITANIUM + EX

-									
Remarks	Pressed at 4 ton cm ⁻² from powders; vacuum sintered 5 hrs each at 400 C, 600 C, 800 C, and 25 hrs at 1000 C, and 12 hrs at 1700-1800 C; value 5-7% lower than theoretical.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	
Sample Specifications	80 Nb, 10 Ti, and 10 Mo; prepared from 98.9 Nb (t.0 Te, 0.05 Ti, 0.03 S, 0.02 C, and 0.01 Fe), 99.9 Mo, and 99.5 Ti (0.1 Ni, 0.058 N ₂ , 0.042 Si, and 0.04 C).	70 Nb, 20 Ti, and 10 Mo; same as above.	60 Nb, 3f Ti, and 10 Mo; same as above.	60 Nb, 20 Ti, and 20 Mo; same as above.	50 Nb, 40 Ti, and 10 Mo; same as above.	50 Nb, 30 Ti, and 20 Mo; same as above.	40 Nb, 40 Ti, and 20 Mo; same as above.	40 Nb, 30 Ti, and 30 Mo; same as above.	
Rept. Error%									
Temp.	208	298	298	298	298	298	248	298	
Pef.	58-22	58-22	58-22	58-22	58-22	58-22	58-22	58-22	
Sym	0	O	٥	Þ	\(\)	•		4	

SPECIFIC HEAT -- NIOBIUM + TITANIUM + EXI



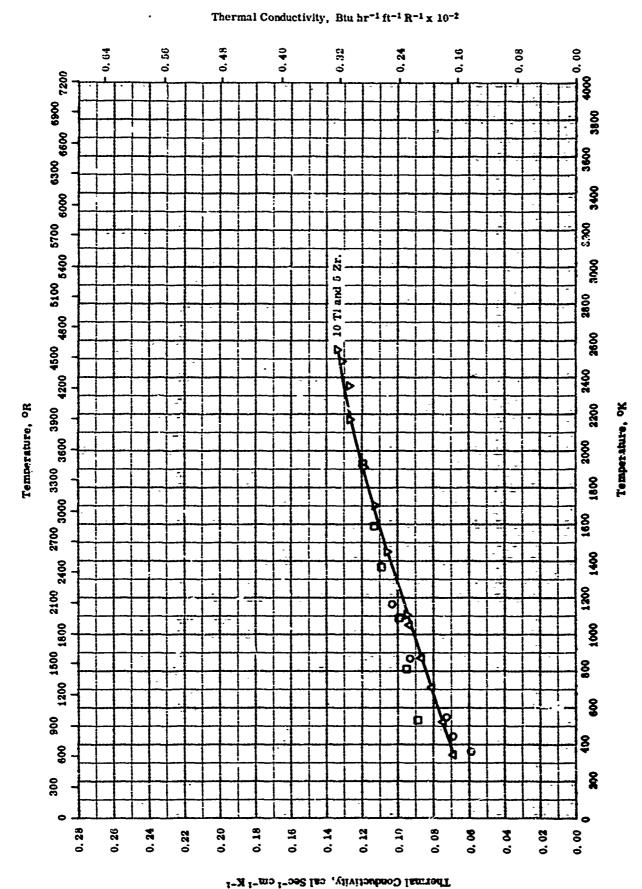
Specific Heat, cal g⁻¹ K⁻¹ Lbuc

specific heat -- niobium + titanium + $\Sigma x_{\rm l}$

Remarks	
Sample Specifications	Cb - 10 Ti - 5 Zr alloy; 10.0 Ti, 4.8 Zr, 0.024 O ₂ , 0.0024 N ₂ . 0.0014 C, and 0.001 4 H ₂ ; density 485 lb ft ⁻³ .
Rept. Error %	0 0
Temp. Range ok	542-2560
Ref.	63-1
E OS	0



THERMAL CONDUCTIVITY -- NIOBIUM + TITANIUM + ΣX_1

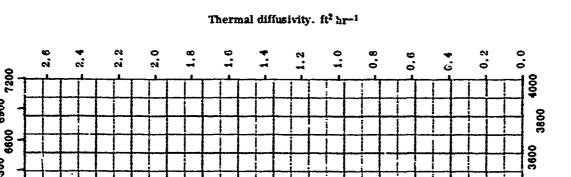


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Thermal conductivity -- niobium + titanium + Σx_1

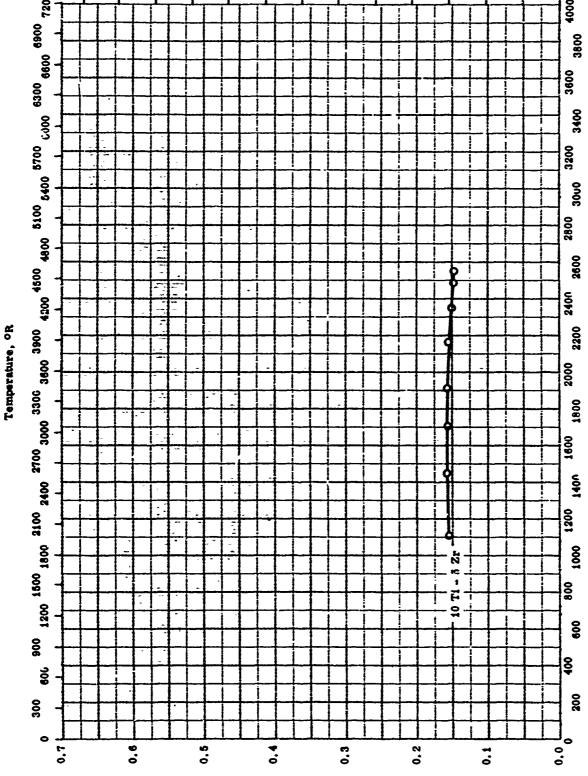
Remarks			End surfaces ground flat and parallel; measured in a He atm.	The above sample measured by another method.	
Sample Specifications	10 Tl and 10 Mo; nominal composition.	10 Tt and 5 Zr; nominal composition.	83.96 Nb, 10.5 Ti, 5.5 Zr, 0.0249 O ₂ , 0.0071 C, 0.0027 N ₂ , and 0.0009 H ₂ ; density 485 lb ft ⁻³ ,	Sumo as above.	
Rept. Error%			4	4	
Tamp.	361-1161	533-1922	342-1053	1105-2544	
Rof.	59-2	62-3	63-1	63-1	
E S	0	0	٥	D	







Temperature, ox



Thermal diffusivity, cm2 Sec-1

THERMAL DEFUSIVITY -- NIOBIUM + TITANIUM + EX

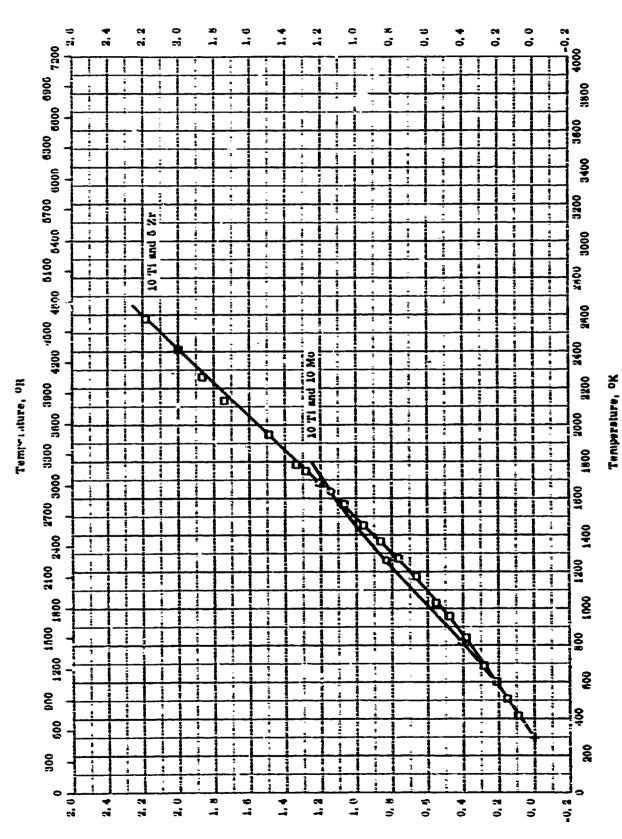
Remraka	Surface ground discs.
Sample Specifications	Nb-10 Ti-3 Zr; 10. 5 Ti, 5. 5 Zr, 0.0249 Og, 0.0071 C, 0.0027 N ₂ , and 0.0009 H ₃ ; density 7.77 g cm ⁻³ .
Rept. Error%	
Temp.	•
Ref.	63-1
50T	0



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THERMAL LINEAR EXPANSION -- NICHEM + TITANIUM + EX

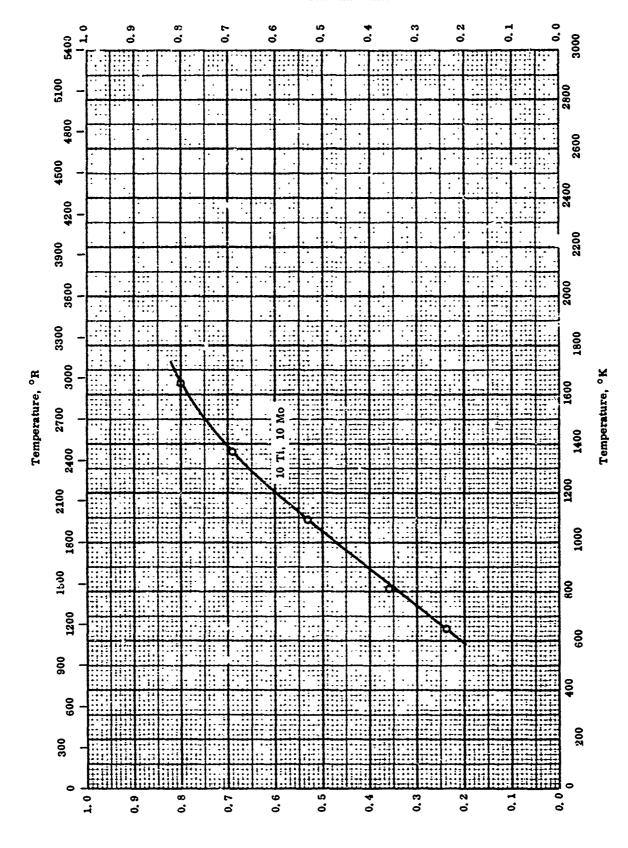




Thermal Linear Expansion, percent

Thermal linear expansion -- niobium + titanium + ΣX_i

Remarks	Double arc-meited in vacuum by E.1. de Pont de Nemours and Co., extruded in air and in argon to 2400-2500 F, recrystallized at 2300 F for 1 hr in an inert atmosphere, and then machined into 3/8 i diameter by 3 in. long specimen by Thompson Products Incorp.	Measured in argon with heating rate of approx 5 F per min.
Sample Specifications	10 Ti and 10 Mo.	DaPont; 85.08 Nb, 10.0 Ti, 4.9 Zr, 0.0244 O, 0.0014 C, 0.0024 N, and 0.0014 H; specimen dimension 1/2 in. din by 0 in. long.
Rept. Error%	A C	α
Temp. Range ok	298-1633	300-2577
Ref.	60-18	63-1
Sym	0	0



NORMAL TOTAL EMITTANCE -- NIOBIUM + TITANIUM + Σx_j

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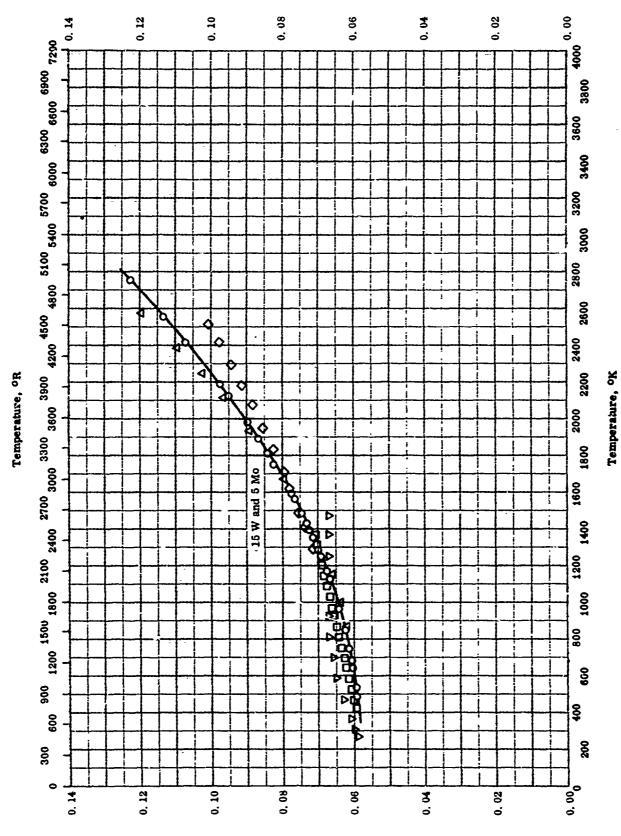
Normal Total Emittance

NORMAL TUTAL EMITTANCE -- NIOBIUM + TITANIUM + $\Sigma X_{\underline{1}}$

Remarks	Measured in helium.
Sample Specifications	10 Ty, and 10 Mo; surface finish 63.
Rept. Error %	平 50
Temp. Range ok	6441644
Ref.	60.18
E TOS	0

是是一个人,我们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,这个人,他们是一个人,他们是一个人, 第二个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人,他们是一个人

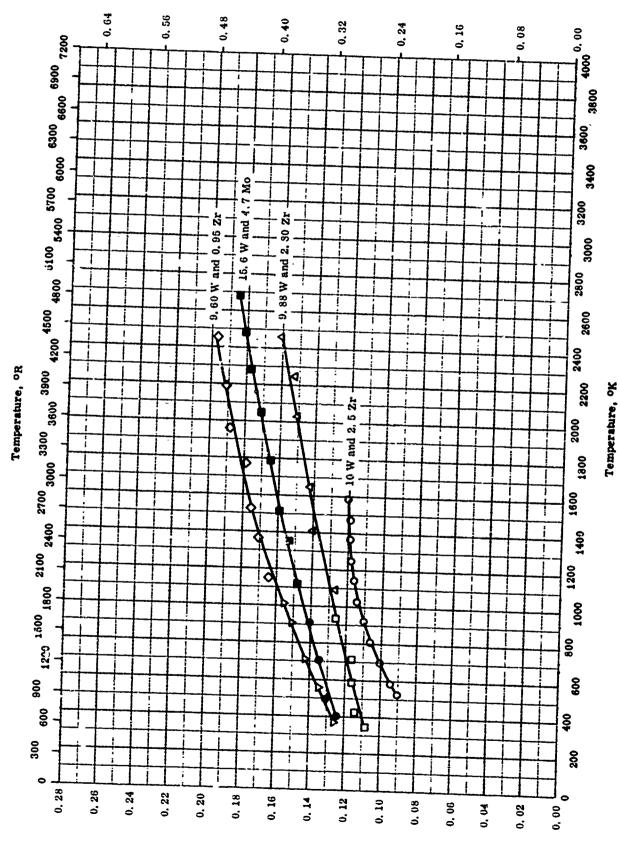
SPECIFIC HEAT -- NIOBIUM + TUNGSTEN + EXI



Specific Heat, cal g" K"

Specific Heat -- Nioblum + Tungsten + $\Sigma X_{\mathbf{I}}$

Remarks	-	Heat troated.						
Sample Specifications	Cb - 15 W - 5 Mo - 1 Zr - 0.05 C alloy; 15.3 W, 5.26 Mo, 1.08 Zr, 0.0340 C, 0.0211 N ₂ , 0.0167 O ₂ , and 0.0061 H ₂ .	F - 48 alloy; 13.8 W, 4.8 Mo, 0.90 Zr, 0.041 C, 0.036 O2, and 0.01" N2.	Cb-10W-5 Zr alloy; 9.93 W, 2.58 Zr, 0.0120 O ₂ , 0.0060 N ₂ , 0.0020 C, and 0.0009 H ₂ , density 572 lb fr ³ .	Cb - 10 W - 1 Zr - 0, 1 C alloy, 9,7 W, 0,88 Zr, 0,0810 C, 0,0052 O ₂ , 0,0033 N ₂ , and 0,000 H ₂ ,	Cb - 752, 87.5 Nb, 10.0 W, and 2.5 Zr,			
Rept. Error%	±5.0		±5.0	±5.0	0.4			
Temp. Range ^o K	487-2740	422-1366	550-2570	455-2510	273-1480			
Ref.	63-1	61-20	63 - 1	63-1	63-5			
E G	0	0	٥	♦	D			



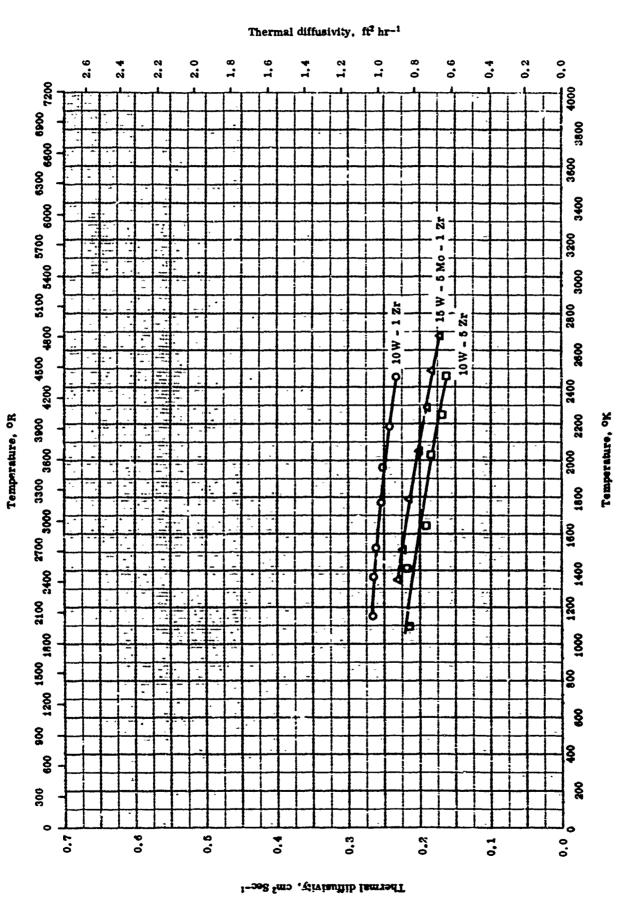
THERMAL CONDUCTIVITY -- NIOBIUM + TUNGSTEN + $\Sigma x_{
m I}$

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

THERMAL CONDUCTIVITY -- NIOBIUM + TUNGSTEN + ΣX_1

Remarks		End surfaces ground flat and parallel; measured in He atm.	The above sample measured by another method.	End surfaces ground flat and parallel; messured in He atm.	The above sample measured by another method.	End surfaces ground flat and parallel; measured in He atm.	The above sample measured by another method.	
Sample Specifications	10 W and 2.5 Zr; nominal composition; density 0.326 lb ln-1.	87.3 Nb, 9.88 W, 2.80 Zr, 0.0082 O ₂ , 0.0042 N ₂ , 0.002 C, and 0.0011 H ₂ ; density 572 lb ft ⁻³ .	Same as above.	89.39 Nb, 9.60 W, 0.85 Zr, 0.0510 C, 0.0053 O ₂ , 0.0033 N ₂ , and 0.0003 H ₂ ; density 564 lb ft ⁻³ .	Same as above.	78.78 Nb, 15.6 W, 4.7 Mo, 0.84 Zr, 0.0489 C, 0.0163 O ₂ , 0.01 Ta, 0.0020 N ₂ , and 0.0005 H ₂ ; density 599 lb ft ⁻³	Same as above.	
Rept. Error%		4	4	4	#	.t.	# #	
Temp. Range ok	533-1590	355-939	1098-2461	372-1011	1150-2455	405-915	1117-2678	
Ref.	63-5	63-1	63-1	63-1	63-1	63-1	63-1	
	0	۵	٥	D	◊	•		

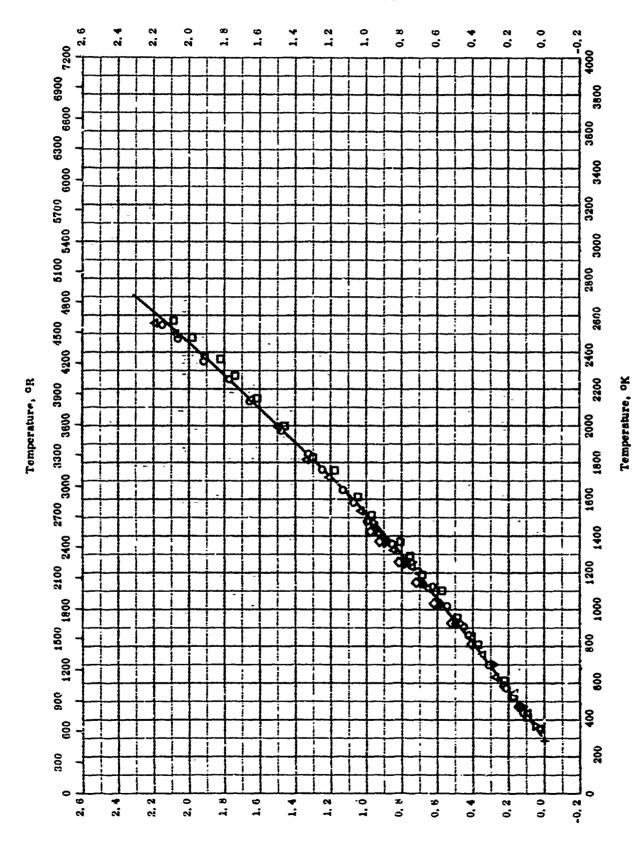




Thermal diffusivity -- nioblum + Tungsten + Σx_i

THERMAL DIFFURVITY -- MOBIUM + TUNGSTEN + EX

Remarks	Surface ground dires.	Surface ground discs.	Surface ground discs.				
Sample Specifications	Nb-10 W-1 Zr-0, 1 C; 9, 8 W, 0, 95 Zr, 0, 051 C, 0, 0053 O2, 0, 033 N2, and 0, 0003 H2; density 9, 04 g cm ⁻³ .	Nb-10 W-5 Zr; 9, 88 W, 2, 80 Zr, 0, 0080 O2, 0, 0040 N2, 0, 002 C Surface ground discs. 0, 0011 H2; density 9, 16 g cm ⁻³ .	Nb-16 W-6 Mb-1 Zr-6,05 C; 15,6 W, 4.7 Mb, 0.84 Zr, 0.0489 C, 0.0163 O2, 0.01 Tu, 0.0020 Nz; and 0.0006 Hz; donsity 9.60 g am ⁻³ .				
Rept.						 -	
Temp.	1 0	1098-2461	1363-2680				
Ref.	63-1	63-1	1-69				
e Sym	0	0	٥	 	 	 	

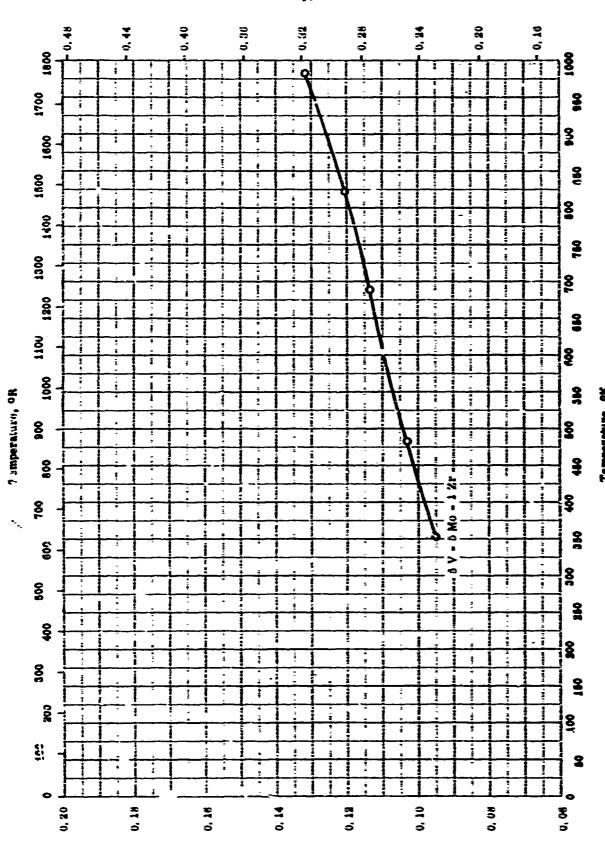


Thermal linear expansion -- niobium + Tungsten + Σx_i

Thermal Linear Expansion, percent

Thermal linear expansion -- nioblum + Throsten + Σx_1

Remarks	Measured in argen; heating.	Ccoling data of above specimen.	Mousured in argon with heating rate of approx 5 F min -1.	Same as above.	Sume as above.	
Sample Specifications	F-48 (huat No. W-5-T), 0, 5 in, gage material; 13, 5-16, 5 W, 4, 5-5, 5 Mo, 0, 85-1, 15 Zr, 0, 1 max Ta, 0, 02-0, 04 C, 0, 02-0, 05 O, 0, 4 max N and 0, 0015 max H.	Same as abovo.	78, 29 Nb, 15, 3 W, 5, 26 Mo, 1, 08 Zr, 0, 0340 C, 0, 0167 O, 0, 0061 H and 0, 0211 N; specimen dimension 1/2 in. dia by 6 in. long.	Haynos Stellite Co.; 87,47 Nb, 9,93 W, 2,58 Zr, 0,002 C, 0,0120 O, 0,0009 H and 0,0060 N; same dimension as above specimen.	DaPont; 89, 26 Mb, 9, 7 W, 6, 88 Zr, 6, 0810 C, 6 0052 O, 6, 004 H and 0, 0033 N; same dimersion as abov : specimen.	Haynes Alloy Cb-762; 87,48 Nb, 10.0 W, 25 Zr, 0.6040 C, 0.0060 C, < 0.0100 N and 0.0006 H; density 0.02 g cm ⁻³ .
Rept.			eı	24	æ	
Tomp.		208-1422	300-2543	300-2560	300-2658	203-1477
Ref.	61-20	61-20	63-1	63-1	63-1	63-23
Sym	\rightarrow	•	0	C	۵	D.



Thermal conductivi. / ... Nichum + Vanadium + 2X

Bermal Conductify, cal Sec-1 cm-1 L'1

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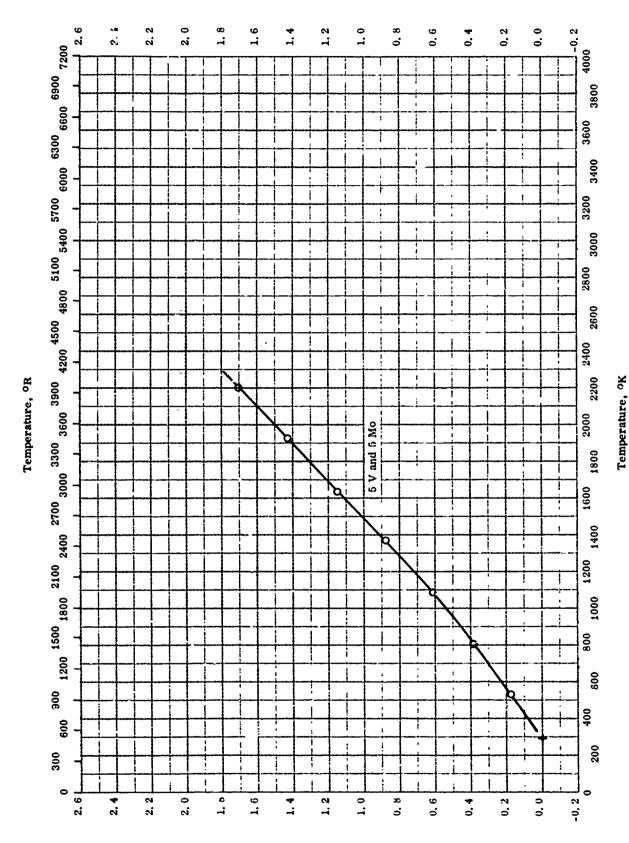
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THERMAL CONDUCTIVITY -- NIOBIUM + VANADIUM + Σx_{j}

REFERENCE INFORMATION

	·
Hemarks	3
Sumple Specifications	5 V, 5 Mo, and 1 Zr; nominal composition.
Rept. Error %	
Temp. Range oK	355-983
Ref.	62-8
Sol Fool	0

Thereal linear expansion -- niobium + varadium + Σx_1



Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- NIOBIUM + VANADIUM + Σx_i

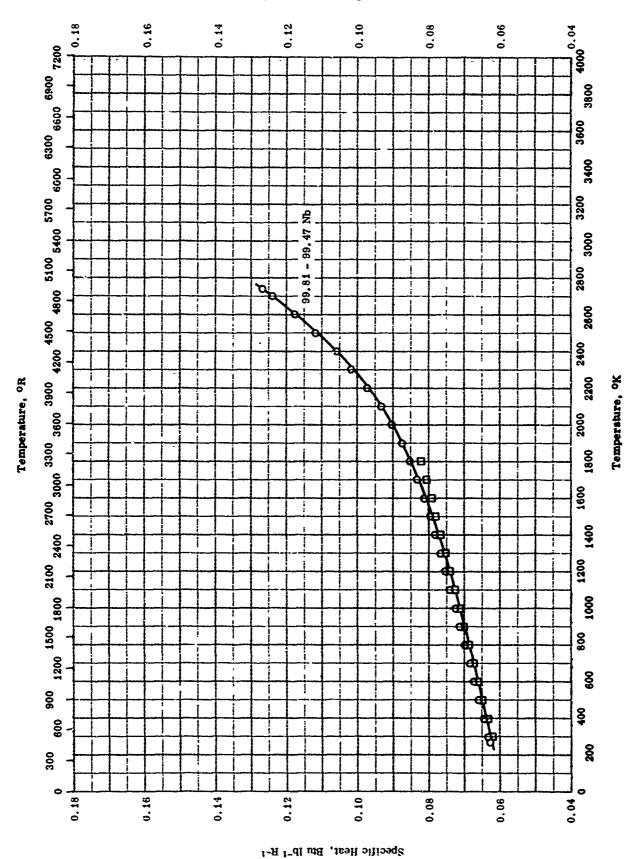
REFERENCE INFORMATION

Remarks	
Sample Specifications	B-66 niobium-base alloy; nominal: 5.0 V, 5.0 Mo, 1.0 Zr, 0.012 O, and 0.006 C, N each; density 0.305 lb in3 and melting point 4300 F.
Rept. Error%	
Temp. Range ok	298-2198
Ref.	62-26
Sym	0

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SPECIFIC HEAT -- NIOBIUM + EXI

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SPECIFIC HEAT -- NIOBIUM + EXI

Remarks	Powder metallurgy and electric arc vacuum melting
Sample Specifications	1. 0 O ₂ impurity.
70	
Rept.	o ; v
Temp. Range ^O K	273-2740 300-1809
Ref.	60-10
Sym	0 🗆

PROPERTIES OF PALLADIUM + COBALT + ΣX_i

REPORTED VALUES

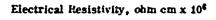
Melt	ing Point:	K	R
0	5.6 Co and 5.4 Cu	1617	2911
	18.6 Co and 12.3 Cu	1452	2614
Δ	30 Co and 10 Cu	1443	?598
V	20 Co and 20 Cu	1413	2544
4	41.2 Co and 11.1 Cu	1434	2581
>	32.2 Co and 20.8 Cu	1400	2520
\Diamond	19.6 Co and 10.3 Au	1570	2826
•	29.6 Co and 10.2 Au	1463	2634
	20 Co and 20 Au	1501	2702
•	29.5 Co and 25.2 Au	1465	2637
▼	34.7 Co and 10.2 Au	1483	2670
◀	20 Co and 15 Au	1493	2688
•	39.5 Co and 10.2 Au	1483	2670
•	29.7 Co and 20.2 Au	1463	2634
•	45 Co and 5.0 Au	1486	2675
•	39.5 Co and 15.2 Au	1473	2652
Δ	29.8 Co and 25.1 Au	1459	2626
•	40 Co and 20 Au	1463	2634
•	30 Co and 30 Au	1463	2634

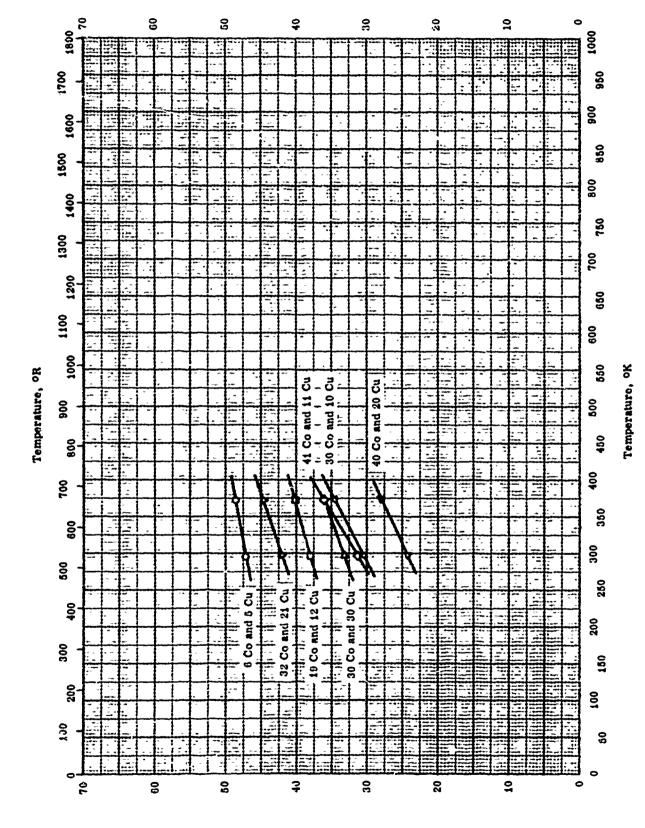
Properties of Palladium + cobalt + Σx_1

66-24 f617 89.0 Pd, 5.6 Co, and 12.3 Cu. 56-24 1462 69.1 Pd, 18.6 Co, and 12.3 Cu. 56-24 1443 60 Pd, 30 Co, and 20 Cu. 56-24 1433 60 Pd, 20 Co, and 20 Cu. 56-24 1434 47.0 Pd 32.2 Co, and 20.8 Cu. 56-25 1400 47.0 Pd 32.2 Co, and 20.8 Cu. 56-26 1670 70.1 Pd, 19.6 Co, and 10.2 Au; same as above. 56-26 1463 60.2 Pd, 20.6 Co, and 20.2 Au; same as above. 56-26 1465 65.3 Pd, 20.5 Co, and 25.2 Au; same as above. 56-27 1483 55.1 Pd, 34.7 Co, and 10.2 Au; same as above. 56-28 1483 55.0 Pd, 20.5 Co, and 10.2 Au; same as above. 56-26 1483 50.3 Pd, 20.5 Co, and 10.2 Au; same as above. 56-26 1483 50.1 Pd, 20.7 Co, and 10.2 Au; same as above. 56-27 50.1 Pd, 20.7 Co, and 50.2 Au; same as above. 56-28 1483 50.1 Pd, 20.7 Co, and 50.2 Au; same as above.	Sym	I Ref.	Temp.	Rept.	Sample Specifications	Remarks
56-24 1617 89.0 Pd, 5.0 Co, and 5.4 Cu. 56-24 1462 69.1 Pd, 18.6 Co, and 12.3 Cu. 56-24 1413 60 Pd, 20 Co, and 20 Cu. 56-24 1413 60 Pd, 20 Co, and 20 Cu. 56-24 1434 47.0 Pd 32.2 Co, and 11.1 Cu. 56-24 1400 47.0 Pd 32.2 Co, and 20.8 Cu. 56-25 1570 70.1 Pd, 19.6 Co, and 10.2 Au; aame as above. 56-26 1601 60.2 Pd, 29.6 Co, and 10.2 Au; same as above. 56-26 1465 65.3 Pd, 29.5 Co, and 25.2 Au; same as above. 56-26 1483 55.3 Pd, 29.5 Co, and 10.2 Au; same as above. 56-27 1483 50.1 Pd, 20.7 Co, and 10.2 Au; same as above. 56-28 1483 50.1 Pd, 20.7 Co, and 20.2 Au; same as above. 56-26 1483 50.1 Pd, 20.7 Co, and 20.2 Au; same as above. 56-26 1483 50.1 Pd, 20.7 Co, and 20.2 Au; same as above. 56-26 1483 50.7 Co, and 20.2 Au; same as above.	8		Range OK	Error %		
56-24 1462 69.1 Pd, 56-24 1413 60 Pd, 20 56-24 1434 47.7 Pd, 56-24 1400 47.0 Pd, 56-24 1400 47.0 Pd, 56-25 1570 70.1 Pd, 56-26 1560 60 Pd, 20 56-27 1463 60.2 Pd, 56-28 1463 65.3 Pd, 56-26 1483 55.0 Pd, 56-27 1483 56.1 Pd, 56-28 1463 50.1 Pd, 56-26 1463 50.1 Pd, 56-27 1483 50.1 Pd, 56-26 1486 50 Pd, 45	0	56-24	1617		5.6 Co, and 5.4 Cu.	M.P. from break in time-temperature curve during cooling.
56-24 1443 60 Pd, 20 56-24 1413 60 Pd, 20 56-24 1434 47.0 Pd 3 56-25 1400 47.0 Pd 3 56-26 1570 70.1 Pd, 20 56-25 1463 60.2 Pd, 20 56-26 1465 60 Pd, 20 56-25 1483 55.3 Pd, 55.1 Pd, 56.1 Pd, 56.25 56-26 1483 50.3 Pd, 50.1 Pd, 50.1 Pd, 50.2 Pd, 45 56-26 1483 50.1 Pd, 45 56-26 1483 50.1 Pd, 45 56-26 1486 50 Pd, 45	0	56-24	1462		18.6 Co, and 12.3 Cu.	Same as above.
56-24 1413 60 Pd, 20 56-24 1434 47.7 Pd, 56-24 1400 47.0 Pd 3 56-25 1570 70.1 Pd, 56-26 1463 60.2 Pd, 56-25 1465 60 Pd, 20 56-26 1483 55.3 Pd, 56-25 1483 55.0 Pd, 56-26 1483 50.3 Pd, 56-26 1463 50.1 Pd, 56-26 1483 50.1 Pd, 56-26 1483 50.1 Pd, 56-26 1483 50.1 Pd,	٥	56-24	1443		Co, and 10 Cu.	Same as above.
56-24 1434 47.7 Pd, 56-24 1400 47.0 Pd 3 56-25 1570 70.1 Pd, 56-26 1463 60.2 Pd, 56-25 1465 60 Pd, 20 56-26 1465 55.3 Pd, 56-25 1483 55.1 Pd, 56-26 1483 55.0 Pd, 56-26 1483 50.3 Pd, 56-26 1483 50.1 Pd, 56-26 1483 50.1 Pd, 56-26 1486 50 Pd, 46	Þ	56-24	1413		Co, and 20 Cu.	Same as above.
56-24 1400 47.0 Pd 3 56-25 1570 70.1 Pd, 56-25 1463 60.2 Pd, 56-26 1463 60.2 Pd, 56-25 1465 55.3 Pd, 56-26 1483 55.0 Pd, 56-25 1483 50.3 Pd, 56-26 1483 50.1 Pd, 56-26 1483 50.1 Pd, 56-26 1486 50 Pd, 45	∇	56-24	1434		41.2 Co, and 11.1 Cu.	Same as above.
56-25 1570 70.1 Pd, 56-25 1463 60.2 Pd, 56-25 1465 60 Pd, 20 56-25 1483 55.3 Pd, 56-25 1483 55.0 Pd, 56-25 1483 50.3 Pd, 56-26 1463 50.1 Pd, 56-25 1486 50 Pd, 45	Δ	56-24	1400			Same as above.
56-25 1463 60.2 Pd, 29.6 Co, and 10.2 Au; same as above. 56-25 1501 60 Pd, 20 Co, and 20 Au; same as above. 56-25 1465 55.3 Pd, 29.5 Co, and 25.2 Au; same as above. 56-25 1483 55.1 Pd, 34.7 Co, and 10.2 Au; same as above. 56-25 1483 50.3 Pd, 39.5 Co, and 10.2 Au; same as above. 56-26 1463 50.1 Pd, 29.7 Co, and 20.2 Au; same as above. 56-25 1486 50 Pd, 45 Co, and 5 Au; same as above.	♦	56-25	1570			Annealed in vacuum 100-150 hrs close to soliduitemperature and slowly cooled; F.P. chtained same method as above.
56-25 1501 60 Pd, 20 Co, and 20 Au; same as ubove. 56-25 1465 55.3 Pd, 29.5 Co, and 25.2 Au; same as above. 56-25 1483 55.0 Pd, 20 Co, and 10.2 Au; same as above. 56-25 1483 50.3 Pd, 39.5 Co, and 10.2 Au; same as above. 54-25 1463 50.1 Pd, 29.7 Co, and 20.2 Au; same as above. 56-25 1486 50 Pd, 45 Co, and 5 Au; same as above.	•	56-25	1463		29.6 Co, and 10.2 Au; same as above.	Same as above.
56-25 1465 55.3 Pd, 29.5 Co, and 25.2 Au; same as above. 56-25 1483 55.1 Pd, 34.7 Co, and 10.2 Au; same as above. 56-25 1493 56.0 Pd, 20 Co, and 15 Au; same as above. 56-25 1463 50.1 Pd, 29.7 Co, and 20.2 Au; same as above. 56-25 1486 50 Pd, 45 Co, and 5 Au; same as above.		56-25	1501			Same as above.
56-25 1483 55.1 Pd,34.7 Co, and 10.2 Au; same as above. 56-25 1493 55.0 Pd, 20 Co, and 15 Au; same as above. 56-25 1483 50.3 Pd, 39.5 Co, and 10.2 Au; same as above. 56-25 1463 50.1 Pd, 29.7 Co, and 20.2 Au; same as above. 56-25 1486 50 Pd, 45 Co, and 5 Au; same as above.	4	56-25	1465		29.5 Co, and 25.2 Au; same as above.	Same as above.
56.25 1493 55.0 Pd, 20 Co, and 15 Au; same as above. 56.25 1483 50.3 Pd, 39.5 Co, and 10.2 Au; same as above. 56.25 1463 50.1 Pd, 29.7 Co, and 20.2 Au; same as above. 56.25 1486 50 Pd, 45 Co, and 5 Au; same as above.	>	56-25	1483			Same as above.
56-25 1483 50.3 Pd, 39.5 Co, and 10.2 Au; same as above. 58-25 1463 50.1 Pd, 29.7 Co, and 20.2 Au; same as above. 56-25 1486 50 Pd, 45 Co, and 5 Au; same as above.	▼	56-25	1493		20 Co, and 16 Au; same as above.	Same as above.
56-25 1486 50.1 Pd, 29.7 Co, and 20.2 Au; same as above. 56-25 1486 50 Pd, 45 Co, and 5 Au; same as above.	A	56-25	1483	 .	39, 5 Co, and 10, 2 Au; same as above.	Same as above.
56-25 1486 50 Pd, 45 Co, and 5 Au; same as above.	•	56-25	1463		29.7 Co, and 20,2 Au; same as above.	Same as above.
	•	56-25	1486			Same as above.
					Table of the Control	

PROPERTIES OF PALLADIUM + COBALT + EX1 (Continued)

Remarks	Same rs above.	Same as above.	Same as above.	Same as above.	
Sample Specifications	45.3 Pd, 39,5 Co, and 15,2 Au; same as above.	45. 1 Pd, 29.8 Co, and 25.1 Au; same as above.	40 Pd, 40 Co, and 20 Au; same as above.	ac Dd, 30 Co, and 30 Au; same as above.	
Ropt. Error %					
Temp. Range ok	1473	1459	1463	1463	
Ref.	56-25	56-25	56-25	66-25	
Sym	8	4	>	•	





ELECTRICAL RESISTIVITY -- PALLADIUM $^{\circ}$ COBALT + Σx_{i} (5 - 30 Co and 5 - 30 Cu)

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Electrical Resistivity, ohm cm x 104

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aaan wateelaumpanan na maranin na saana saana ka maa wateela ka ka maa wateela ka ELECTRICAL RESISTIVITY -- PALLADIUM + COBALT + Σx_1 (6 - 30 Co and 5 - 30 Cu)

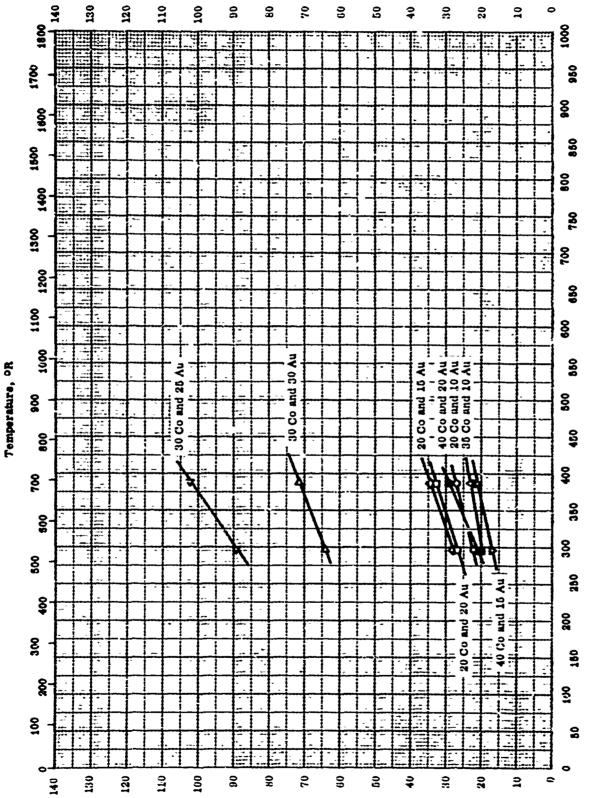
_								
Remarks	annealed for 150 hrs at 1000 C in vacuum and cooled in 10 hrs.	Same as above.	Same as above.	Same as above.	Same as above.	Sume as above.	Same as above.	
Sample Specifications	89.0 Pd, 5.6 Co and 5.4 Cu.	69. 1 Pd, 18. 6 Co and 12. 3 Cu.	60.0 Pd, 30.0 Co and 10.0 Cu.	47.7 Pd, 41.2 Co and 11.1 Cu.	47.0 Pd, 32.2 Co and 20.8 Cu.	40.0 Pd, 40.0 Co and 20.0 Cu.	40.0 Pd, 30.0 Co and 30.0 Cu.	
Rept.								
Temp.	208-373	208-373	298-373	208-373	298-373	298-373	298-373	
Ref.	56-24	56-24	56-24	66-24	56-24	66-24	26-24	
E So E	0	0	4	\	D	▽	Δ	

Temperature, oK

Tamperature, oK

ELECTRICAL RESISTIVITY -- PALLADIUM + COBALT + EX

(10-40 Co and 10-30 Au)



Electrical Resistivity, ohm cm x 10

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EINCTRICAL RESISTIVITY -- FALLADIUM + COBALT + EX. (10-40 Co and 10-30 Au)

- 1									
Rumarks	Annealed for 100-150 hrs close to solidus temp. in vacuum and cooled slewly to room temp.	Same as above.	Same as above.	Sume as above.	Beme us above,	Same as above,	Sume as above.	Samo as above.	
						-			
al Action and									
ž C									
Sample Specifications	•		-			-			
200	10. 31 Av		10, 2 Au	ء.	.6. 2 Au	16, 1 Au		•	
3	, and 1	d 20 Au	, and 1	1 16 Au	, and 1	, und 2	1 20 Au	1 30 Au	
l	10. 0 Co	Co, and	4. 7 Co	Co, un	19, A Cu	19. 8 Co	Co, m	Co, Any	
	76, 1 Pu, 10, 6 Co, and 10, 3 An.	60 Pd, 20 Co, and 20 Au.	66, 1 Pd, 54, 7 Co, and 10, 2 Au.	00 141, 20 Cto, and 16 Au.	46, 3 Pd, 39, f Co, and 16, 2 Au.	46, 1 Pd, 29, 8 Co, and 26, 1 Au.	40 Pd, 40 Co, and 20 Au.	40 Pd, 40 Co, and 30 Au.	
_		20	00	90	49.	46.	9	- - -	 •
Error %									
		17.0	17.0	17.0	17:3		- 621	173	
	208-373	308-373	206-373	208-373	808-973	208-373	208-373	268-873	
RADKE.									
Ref. Lamp.	5 0 2. 00	90-99	86-28	52-55	97-00	00-20	07-09	00 AT	

properties of palladium +copper+ Σx_i

REPORTED VALUES

Melt	ing Point:	K	R
0	26.5 Cu and 5.0 Co	1435	2583
0	21 Cu and 10.5 Co	1427	2569
Δ	20 Cu ard 20 Co	1413	44رځ
∇	29 Cu and 11.9 Co	1406	2531
\Diamond	35.7 Cu and 16.3 Co	1383	2490
•	41 3 Cu and 12 1 Co	1393	2508

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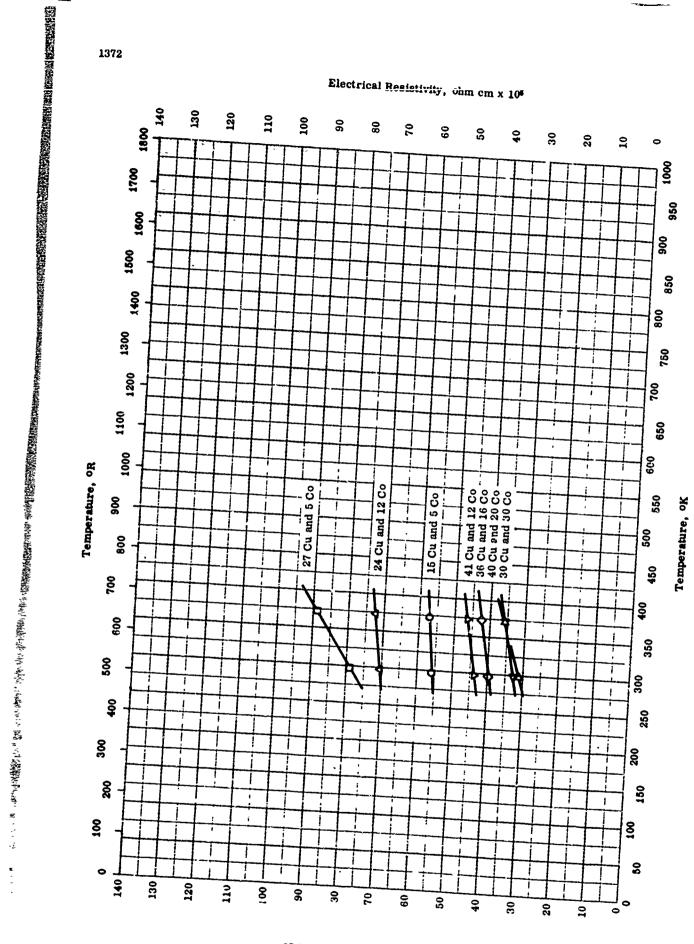
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Properties of palladium +copper + Σx_l

REFERENCE INFORMATION

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ELECTRICAL RESISTIVITY -- PALLADIUM + COPPER + 5X₁ (15 - 40 Cu and 5 - 30 Co)

Electrical Resistivity, ohm cm x 10s

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ELECTRICAL RESISTIVITY -- PALLADIUM + COPPER + EXI (15 - 40 Cu and 5 - 30 Co)

REFERENCE INFORMATION

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Remarks	Annealed for 150 hrs at 1000 C in vacuum and cooled in 10 hrs.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above,	Same as above.	
Sample Specifications	80 Pd, 15 Cu, and 5 Co.	68. 5 Pd, 26. 5 Cu, and 5. 0 Co.	59. 1 Pd, 24. 0 Cu, and 11. 9 Co.	48. 0 Pd, 35. 7 Cu, and 16. 3 Co.	47.6 Pd, 41.3 Cu, and 12.1 Co.	40 Pd, 40 Cu, and 20 Co.	40 Pd, 30 Cu, and 30 Co.	
Kept. Error %								
remp. Range OK	298-373	298-373	298-373	298-373	298-373	298-373	298-373	
Ref.	56-24	56-24	56-24	56-34	56-24	56-24	56-24	
1								

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PROPERTIES OF PALLADIUM + GOLD + ΣX_i

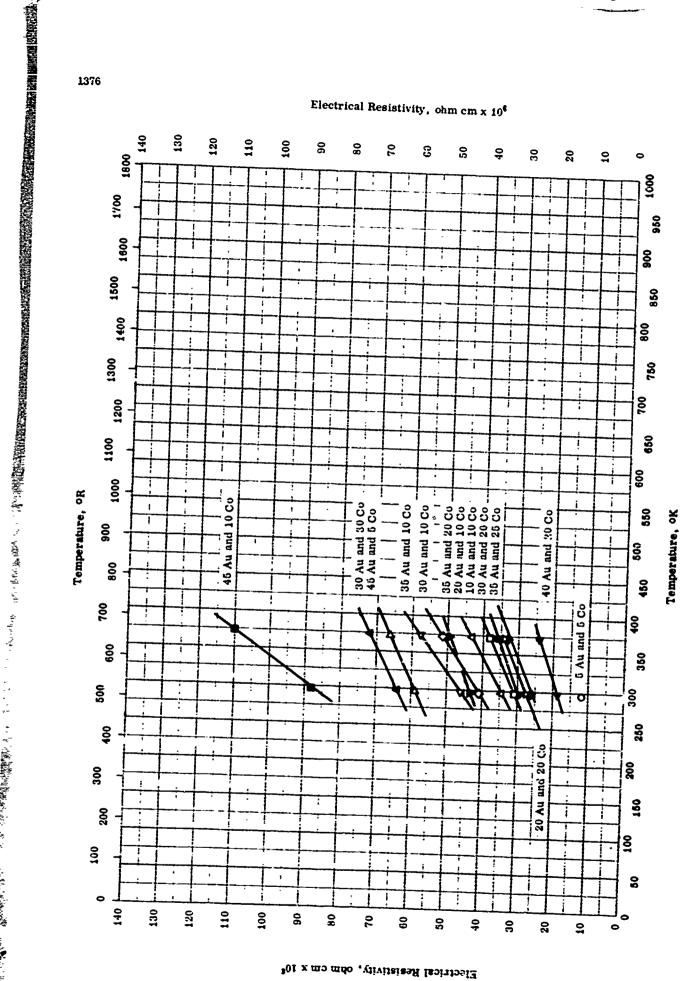
REPORTED VALUES

Melt	ing Point	К	R
0	5.1 Au and 4.7 Co	1651	2972
	10.2 Au and 9.8 Co	1605	2889
Δ	20 Au and 10 Co	1591	2864
⊽	30 Au and 10 Co	1567	2821
٥	20 Au and 20 Co	1501	2702
\triangleright	35 Au and 10 Co	1553	2796
\Diamond	45 Au and 5 Co	1603	2886
•	40 Au and 10 Co	1553	2796
	30 Au and 20 Co	1466	2639
•	45 Au and 10 Co	1533	2760
▼	35 Au and 20 Co	1463	2634
4	40 Au and 20 Co	1466	2639
•	35 Au and 25 Co	1459	2626
•	30 Au and 30 Co	1463	2634

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properties of palladium + gold + $\Sigma x_{\underline{i}}$

Sym	n Ref.	Temp.	Rent.		
8		Runge ok	Error%	Sample Specifications	Remarks
0	56-25	1651		90.2 Pd, 5.1 Au, and 4.7 Co; ingredients with < 0.01 impurities.	Annealed in vacuum 100-150 hrs close to solidus
					temperature and slowly cooled; M.P. from break
!					in time-temperature curve during cooling.
0	56-25	1605		80. Pd, 10.2 Au, and 9.8 Co; same as above.	Same as above.
4	56-25	1591		70 Pd, 20 Au, and 10 Co; same as above.	Same as above.
Þ	56-25	1567		60 Pd, 30 Au, and 10 Co; same as above.	Same as above.
⊽	56~25	1991		60 Pd, 20 Au, and 20 Co; same as above.	Same as above.
Δ	22-99	1553		55 Pd, 35 Au, and 10 Co; same as above.	Same as above.
\ \	26-25	1603		50 Pd. 46 Au, and 6 Co; same as above.	Same as above.
•	56-26	1563		50 Pd, 40 Au, and 10 Co; same as above.	Same as above.
	56-25	1466		50 Pd, 30 Au, and 20 Co; same as above.	Same as above.
◀	56-25	1533		45 Pd, 45 Au, and 10 Co; same as above.	Same as above.
>	56-26	1463		5 Pd, 35 Au, and 20 Co; sume as above.	Same as above.
▼	56-25	1466		40 Pd, 40 Au, and 20 Co; same as above.	Same as above.
A	56-25	1459		40 Pd, 35 Au, and 25 Co; same ns above.	Same as above,
•	56-25	1463		40 Pd, 30 Au, and 30 Co; same as above.	Same as above.
			•		
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ELECTRICAL RESISTIVITY --- PALLADAUM + GOLD + Σx_1

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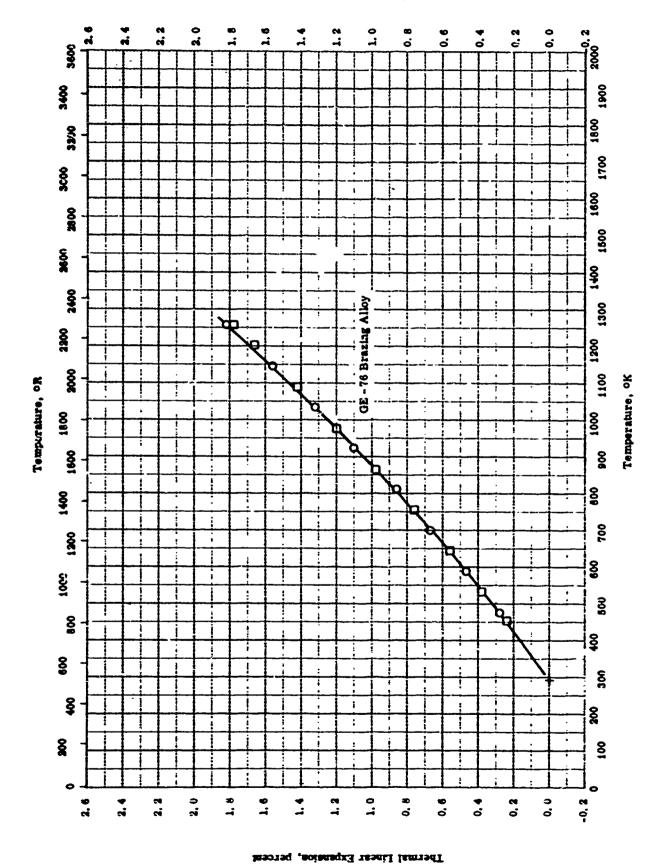
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ELECTRICAL RESISTIVITY -- PALLADIUM + GOLD + EX

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	Ref.	Temp.	Rept. Error%	Sample Specifications	Remarks
•3	50-26	208-373		00, 2 Fd, 6, 1 Au, and 4, 7 Co.	Annealed for 100-150 hrs, close to solidus temp-
					eruture in vacuum, and cooled slowly to room
	- 				tomporature.
~	00-26	208-373		80, 0 Pd, 10, 2 Au, and 9, 8 Co.	Same as above.
	56-25	208-373		70 Pd, 20 Au, and 10 Co.	Same as above.
-	56-26	208-373		60 Pd, 30 Au, and 10 Co.	Savne as above,
•	66-25	208-373		60 Pd, 20 Au, and 20 Co.	Same as above,
•	92-99	208-373		66 Pd, 36 Au, and 10 Co.	Same as above.
•	06-25	208-373		60 Ad, 46 Au, and 6 Co.	Sume us above.
-	56-25	298-373		50 141, 30 Au, and 20 Co.	Same as above.
	20-20	208-373		45 Pd, 46 Au, and 10 Co.	Same as above.
-	66-26	208-373	-	46 Pd, 35 Au, and 20 Co.	Same as above.
-	56-25	208-373		40 Pd, 40 Au, and 20 Co.	Sume as above.
	00-20	298-373		40 Pd, 36 Au, and 26 Co.	Sume as above.
	92-99	200-373		40 Pd, 30 Au, and 30 Co.	Same as above.
			_		

PARTICULAR DESCRIPTION OF THE PROPERTY OF THE



Thermal linear expansion -- Palladium + Nickel + 2X

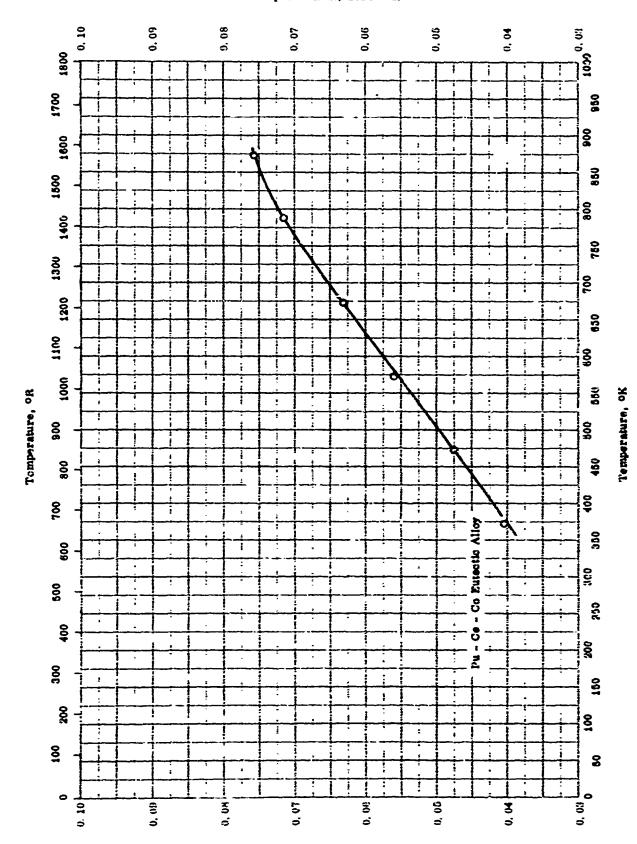
TPRC

A CONTROLL OF THE STATE OF THE

Thermal linear expansion -- palladium + nickel + Σx_i

П	pu ,	· · · · · · · · · · · · · · · · · · ·
Remarks	As east; avorage data of two complete heating and cooling cycles; tested in 40 \mu Hg varuum with a heating rate at 5.4 F min ⁻¹ .	at 2000 F in argon atmosphere.
Sample Specifications	GE-70 Brazing Alloy; nominal: 44 Pd, 33 Ni, and 23 Cr; analysis shows 0, 05 Si and 0, 014 S.	
Ropt. Error%	н Сі	73 H
Temp.	203-1265	
Ref.	64-30	
E o So	0	3

The state of the s



SPECIFIC REAT -- PLUTONIUM + CERIUM + ZX

TPRC

Specific Heat, cal 5" K"

Sprcific heat -- Plutonium + Cemum +224

REFERENCE INFORMATION

Remarks	
Ranple Prealications	Po - G3 - Co sutrette ullay.
Rape.	
Permy,	1773 673
Rof.	(t-89
25.00 10.00	0

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PROPERTIES OF PRASEODYMIUM + ΣX_{i}

REPORTED VALUES

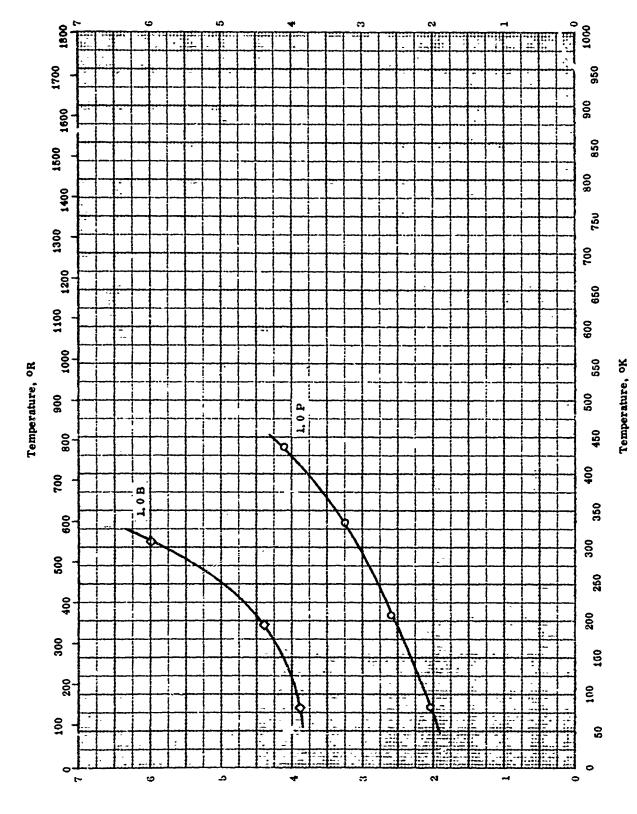
Melting Point: K R $0 \approx 99 \text{ pure}$ 1159 2087

PROPERTIES OF PRASEODYMUN: $+\Sigma X_{\rm I}$

REFERENCE INFORMATION

Remarks	by O ₂ considered by authors.
Sample Specifications	99 estimated purity.
Rept. Error %	
Temp. Range ^O K	1160
Ref.	43.3
SVIE	0

Electrica? Resistivity -- Silicon + Σx_i



Electrical Resistivity, ohm cm x 104

TPRC

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ELECTRICAL RESISTIVITY -- SILICON + EX

÷.

1₂ .

REFERENCE INFORMATION

Remarks	Author estimates $\gamma = 10^6$ ohm cm for ideally pure Si at room temp.	Sume as above.	
Sample Specifications	1, 0 B.	L. U P.	
Rept. Error %			
Temp. Range ok	80-436	83~306	
kef.	49-5	49-5	
E log	0	^	

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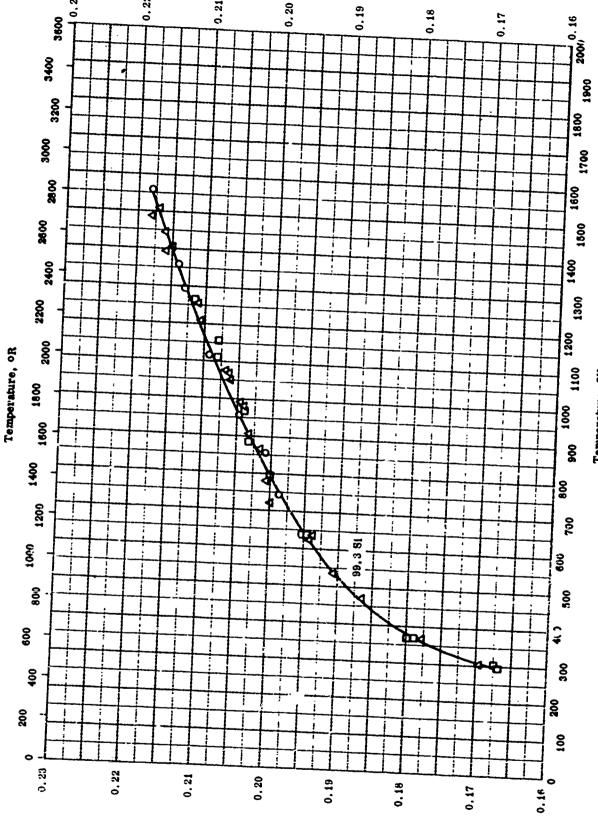
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SPECIFIC HEAT -- SILICONE + ΣX_1

Specific Heat, cal $g^{-1} \, K^{-1}$

TPRC

The state of the s

specific heat -- silicone + ΣX_1

REFERENCE INFORMATION

- 1	ı							 			 		
Remerte						-			-				
			· · · ·					 					_
Sample Specifications	Specimon 1; 99,3 Si.	Specimon 2; 90, 3 81,	Specimen 3; 99, 3 81.										
Rept. Error%							 			-			
Temp.		207-1261	297-1509									 -	7
Rof.	8-29	62-8	62-8										1
200 100 100 100 100 100 100 100 100 100	0	0	٥		 								

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この語彙を含めては、このこのでは、これのはないにはない。

PROPERTIES OF TANTALUM + COPPER + ΣX_i

REPORTED VALUES

Density: g cm⁻³ lb ft⁻³
O 0.15 Cu and 0.73 Zr 16.66 1040

TPRC

PROPERTIES OF TANTALUM + COPPER + EX,

REFERENCE INFORMATION

Remarks	Sintered, then swaged; letter from authors corrects orror in original reference.
Sample Specifications	0.73 onch Cu and Zr, 0.21 Fo, 0.06 Nl, 0.08 C, 0.97 Co, 0.03 Mn, 0.02 Sl, 0.017 Al, 0.0647 Cr, and 0.0033 Cn.
Rept. Error%	
Temp. Range ok	50 50 50 50 50 50 50 50 50 50 50 50 50 5
Re (,	96
No.	0

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Temperature, on

0. 22

0.20

0, 18

0. 52

-

0, 36

0.32

0, 28

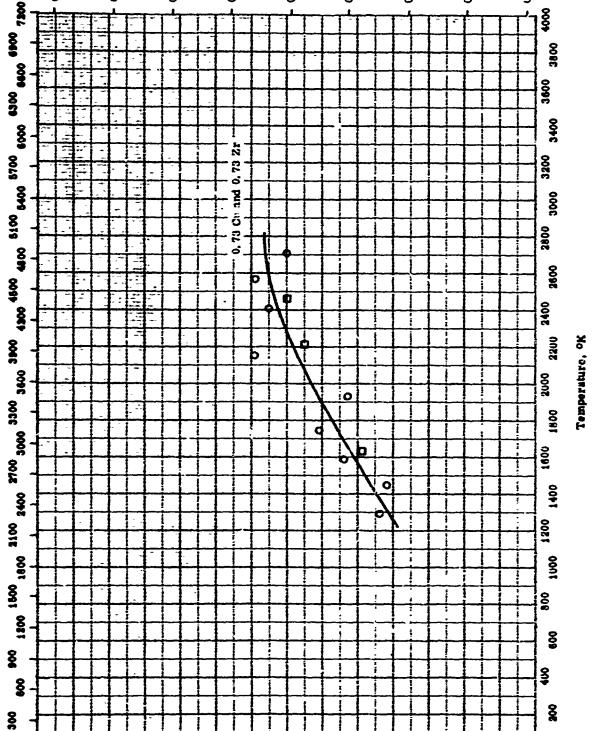
0.24

0, 10

0, 12

90 '0

U. 20



Thermal conductivity -- Tantalum + Copper + EX

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K^{-1}

0. 14

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THERMAL CONDUCTIVITY -- TANTALUM + COPPER + EX

HEFERENCE INFORMATION

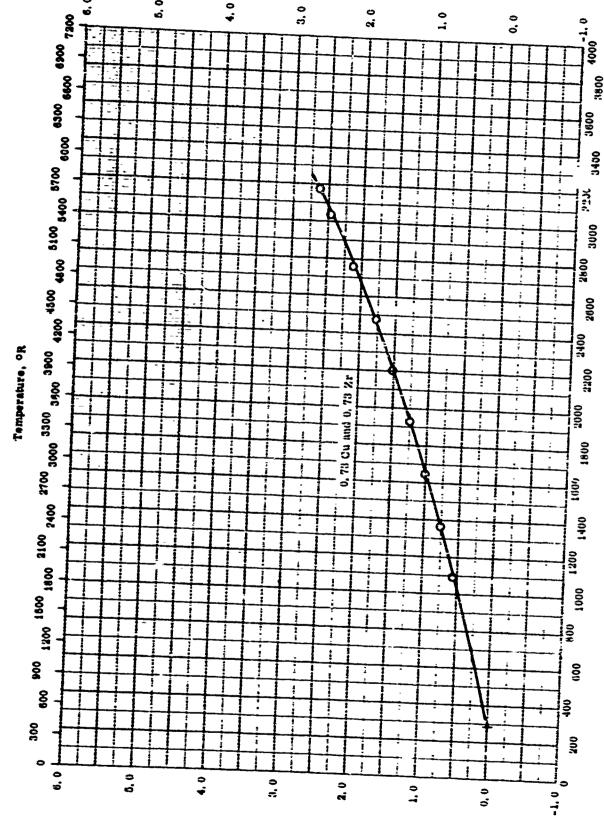
Remarks	Sintered; swaged to give density: heating.	Same as above except measured during cooling.	
Sample Specifications	Composition before test: 0.73 Cu, 0.73 Zr, 0.21 Fe, 0.06 Ni, 0.08 C, 0.07 Co, 0.03 Mn, 0.02 Mi, 0.017 Ai, 0.0047 Cr, and 0.0033 Cn, and after test: 0.013 C, 0.013 Mi, 0.0023 Cr, and 0.0039 Cu; density 1040 lb ft?,	Same as above,	
Error %			
Yo anum)		1552-2467	
Hof.	06-7	56-7	
10% 10%	c	Ö	

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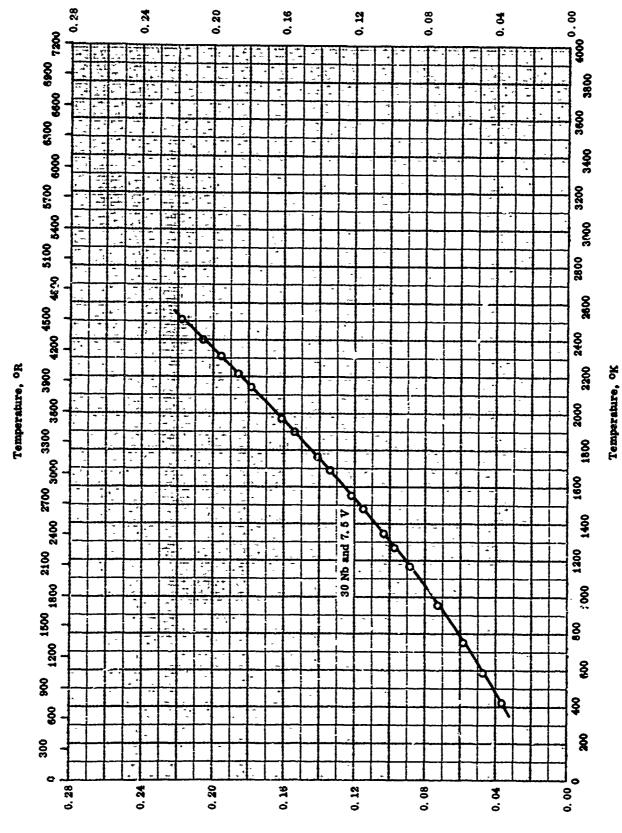


Thermal Linear Expansion ... Tantalum + copper + 5x1

Thervasi Linear Expansion, percent

Thermal linear expansion -- Tantalum + Copper + EX

Romarks	Pressod, sintered, and swaged to given density; data shown are smoothed; taking during second heating and cooling cycle; letter from author indicates error in original reference which gives density 14, 4, 4 g on "", corrected density 10, 66 g om "".
Sample Specifications	Bufore tout; 0, 73 Cu, 0, 73 Zr, 0, 21 Fu, 0, 000 Ni, 0, 096 Ci, 0, 070 Co, 0, 030 Mn, 0, 020 Si, 0, 004 Cr, and 0, 0033 Cu; after test; 0, 0100 C, 0, 013 Si, 0, 0023 Cr, 0, 0010 Cu, and none of others; density 1040 ib ft ⁻² .
Rept.	
Temp.	84T):690T
Ref.	7- 90
LIS Se	0

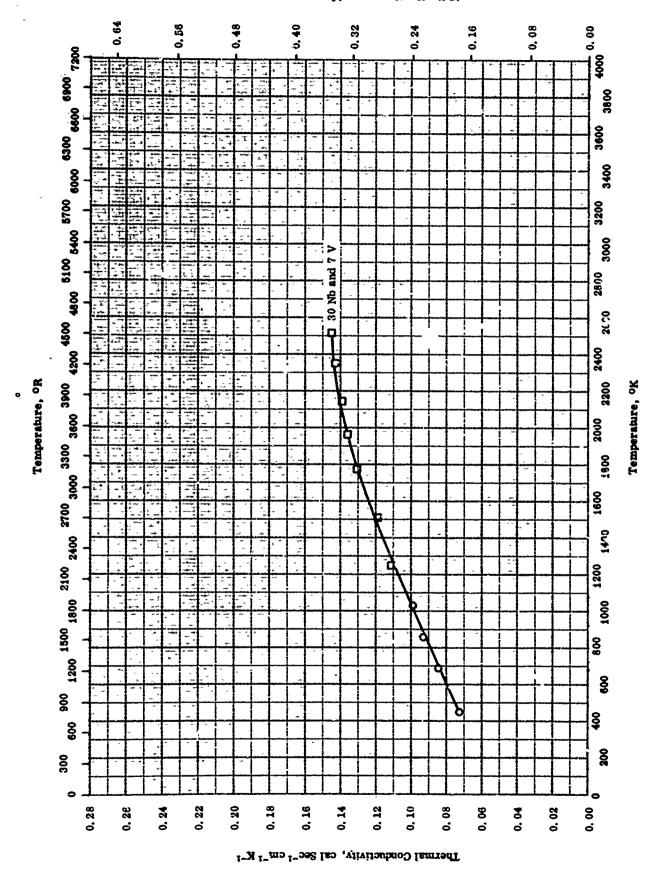


SPECIFIC HEAT -- TANTALUM + NIOBIUM + ΣX_1

Specific Heat, cal g"! K"!

Specific heat -- tantalum +niobium + Σx_1

Remarks	
Sample Specifications	Ta - 50 Cb - 7.5 V alloy; 30.3 Nb, 7.47 V, 0.050 C, 0.0150O ₂ , and 0.0065 N ₂ .
Rept. Error%	O 'S'
Temp. Rarge ok	422-2510
Rei.	63-1
E 8	0



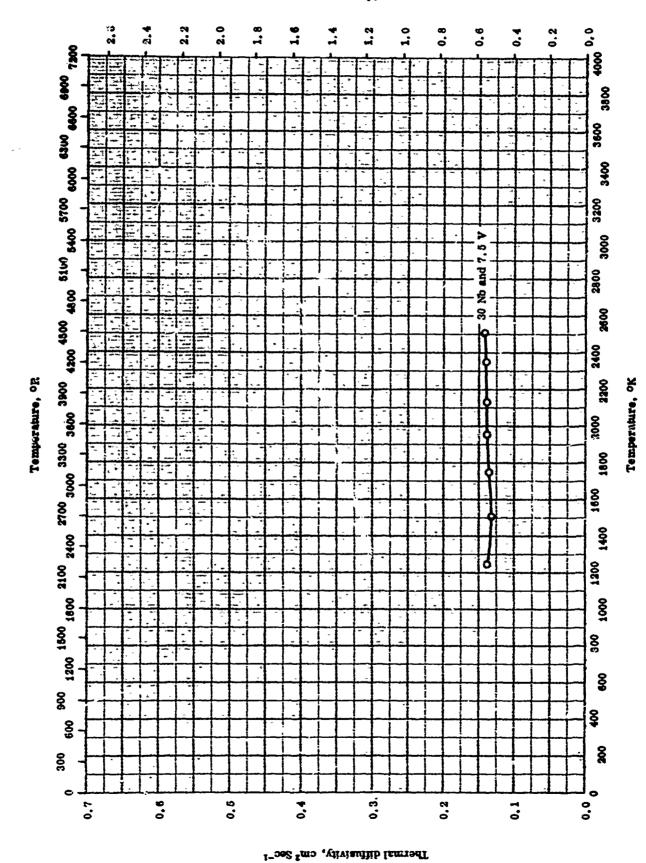
TPRC

THERMAL CONDUCTIVITY -- TANTALUM + NIOBIUM + EX

THERMAL CONDUCTIVITY -- TANTALUM + NIOBIUM + ΣX_{j}

_			
Remarks	End surface ground flat and parallel; measured in a He atm.	The above sample measured by another Keddod.	
Sample Spenifications	62. 12 To, 30.3 Nb, 7.47 V, 0.080 C, 0.0150 O2, and 0.0065 N3; End surface ground flat and paralloi; measured in density 721 lb ft-3.	Same as above.	
Rept. Error %	4	4	
Temp. Range UK	463-1030	246-2511	
Ref.	63-1	63-1	
150 100 100	0	0	

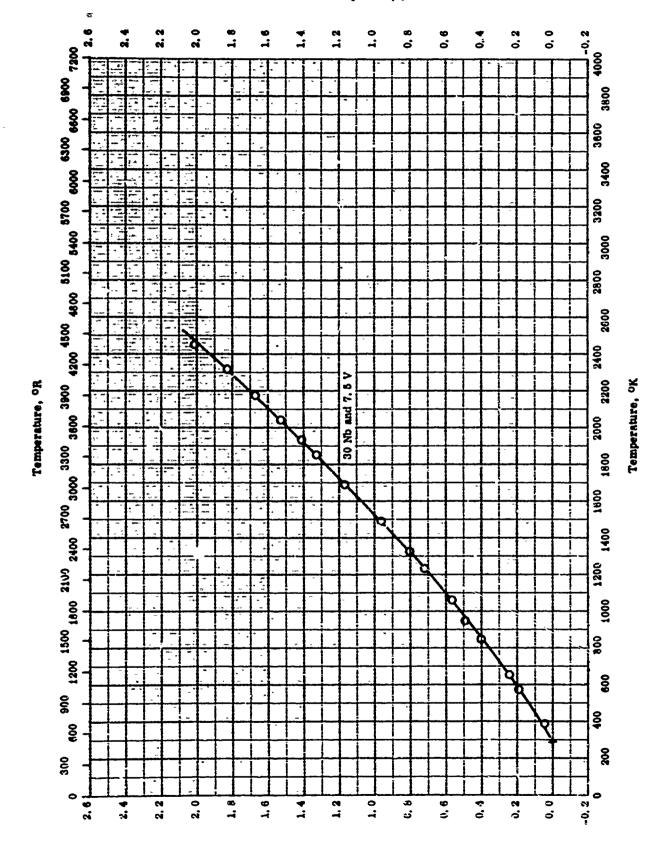
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THERMAL DIFFUSIVITY -- TANTALUM + NIOBIUM + EXI

Thermal diffusivity -- Tantalum + niobium + Σx_1

Remarks	Surface ground discs.
Sample Specifications	7a-30 Nb-7, 5 V; 30, 3 Nb, 7, 47 V, 0, 090 C, 0, 0150 O ₂ , and 0, 0065 N ₂ ; density 11, 55 g cm ⁻³ .
Rept.	
Temp. Range ok	1246-2613
Ref.	£-5
#58 #58	0



Thermal linear expansion -- Tantalum + Niobium + Ex

Thermal Linear Expansion, percent

Thermal linear expansion -- Tantalum + Niobium + ΣX_j

Romarks	Measured in argon with heating rate of approx. 5 F min-1,
Sample Specifications	Wah Chang Corp.; 62. 12 Ta, 30.3 Nb, 7.47 V, 0.090 C, 0.0° 10 C, and 0.0065 N; donsity 721 lb ft ⁻² ; dimension 1/2 in, dia, by 6 in, long.
Rept.	N
Temp.	300-2443
Ref.	1- 56
100 100 100 100 100 100 100 100 100 100	0

PROPERTIES OF TANIALUM + TUNGSTEN + ΣX_{i}

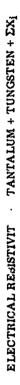
REPORTED VALUES

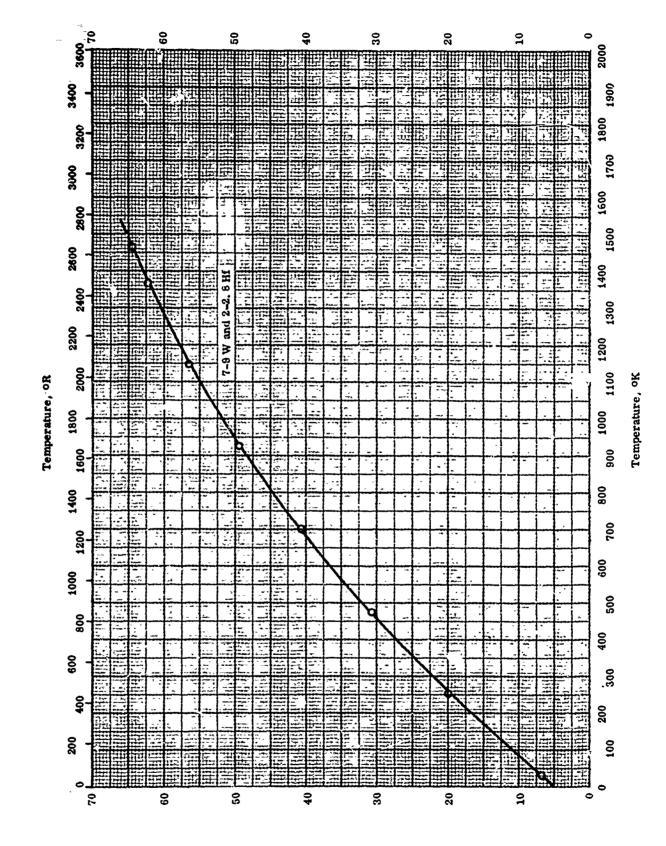
 Melting Points
 K
 R

 O 8-9 W and 2-3 Hf
 3256
 5860

Properties of Tantalum + Tungsten + Ex

_		
	Remarks	
	Sample Specifications	Ta-5W-21if; 7-9 W, 4-2.81if, 0.003-0.01 O, 0.003-0.007 N, and 0.004-0.003 C; density 0.604 ib in ⁻³ .
1300	Error %	
•	Range ok	3286
Γ	Ref.	63-10
	52	0

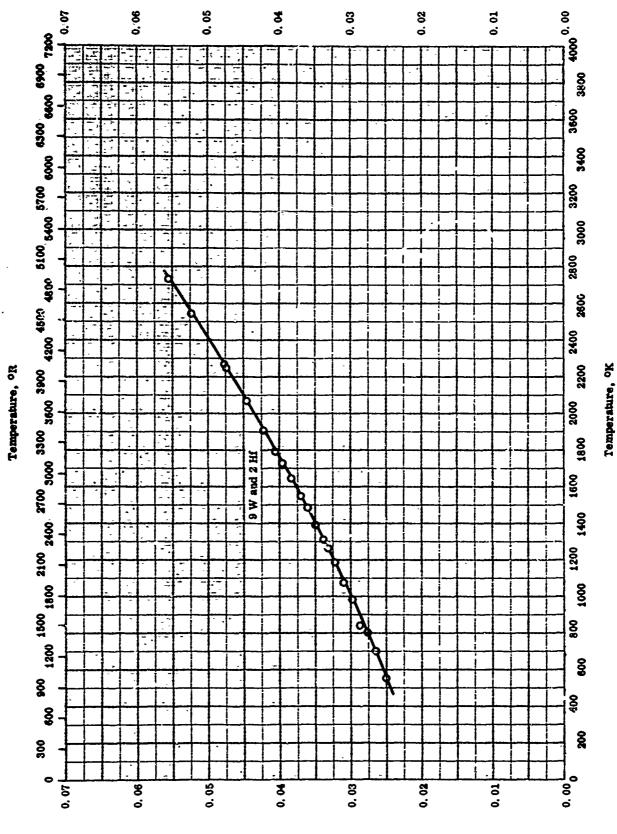




Electrical Resistivity, ohm om x 104

ELECTRICAL RESISTIVITY -- TANTALUM + TUNGSTEN + ΣX_{j}

Remarks	
Sample Specifications	Ta-SW - 2 Hf; 7.0-9, 0 W, 2.0-2, 8 Hf, 0.003-0.01 O, 0.003- 3.007 N, and 0.001-0.003 C; density 0.604 lb in ⁻³ .
Rept. Error%	-
Temp. Range ok	33-1467
Ref.	63-16
H S	0



SPECIFIC HEAT -- TANTALUM + TUNGSTEN + EX

Specific Heat, cal g" K"

specific heat -- tantalum + tungsten + Σx_{i}

Remarks	
Sample Specifications	0.0023 Ng; density 1058 lb ft ⁻³ .
Rept.	± 5. 0
Temp.	0640-2730
Ref.	63-1
#3 28	0

And the Alexander of the Angel

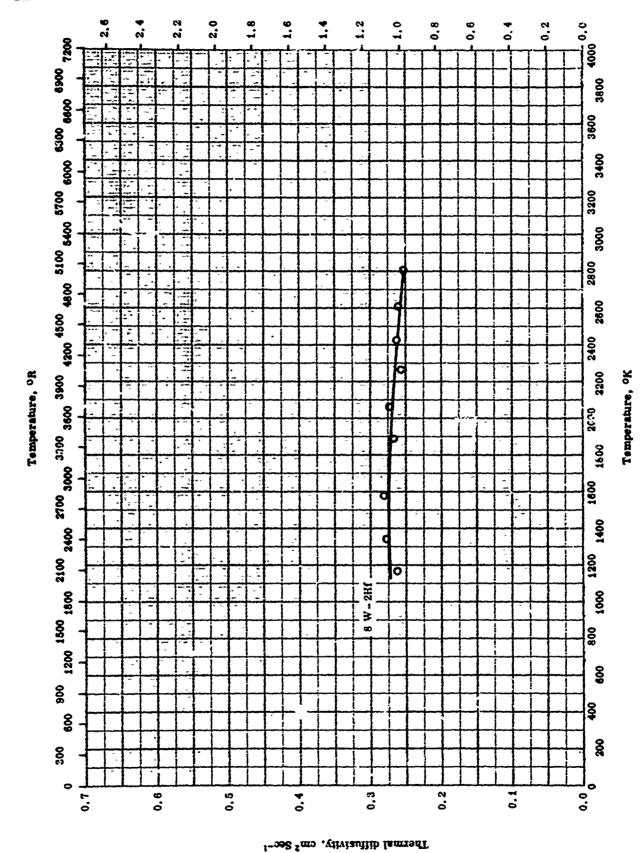
THERMAL CONDUCTIVITY -- TANTALUM +TUNGSTEN + Σ_{χ_1}

Thermal Conductivity, cal Sec-1 cm-1 K-1

THERMAL CONDICTIVITY -- TANTALUM + TUNGSTEN + T.N.

Remarks	End surface ground flat and parallel; measured in He atm.	The above sample measured by another method.	
Sample Specifications	88.79 Ta, 9.0 W, 2.2 Hf, 0.0041 C, 0.0040 O ₂ , and 0.0023 N ₂ ; density 1058 lb ft ⁻³ .	Same as above.	4
Rept.	41	##	
Temp.	505-1072	1172-is03	
Ref.	63-1	63-1	-
100	၁	0	

The same of the sa

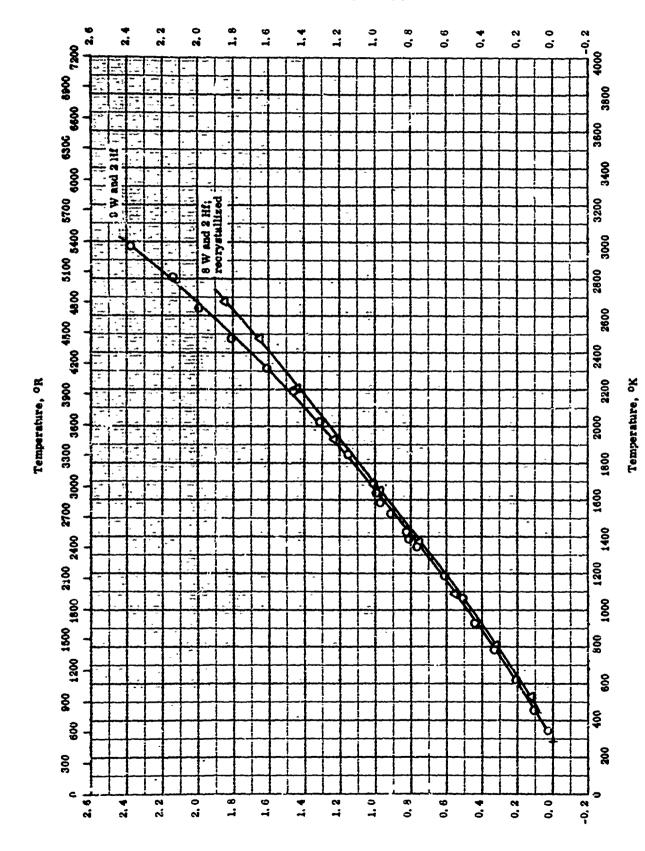


TPRC

Thermal diffusivity -- Tantalum + Tungsten + $\Sigma X_{
m I}$

Thermal diffusivity -- Tantalum + Tungsten + $\mathcal{K}_{\mathbf{i}}$

Remarks	Surface ground discs.
Sample Specifications	T38 W-2 Hf; 9.0 W, 2.2 Hf, 0.0041 C, 0.0040 O ₂ , and 0.0023 N ₂ ; consity 16.95 g cm ⁻³ .
Rept.	
Temp.	•
Ref.	63-1
100 E	0



THERMAL LINEAR EXPANSION -- TANTALUM + TUNGSTEN + EX

Thermal Linear Expansion, percent

Thermal linear expansion -- Tantalum + Tungsten + Σx_i

		6. 8 F
Remarks	Mossured in argon with heating rate of approx. 6 F min-1,	Recrystallized; measured at a heating rate of 6, 8 F min" in vacuum; no significant change in dimension observed after the measurement.
Sample Specifications	Westinghouse Electric Corp.; 88, 79 Ta, 9, 0 W, 2, 2 Hf, 0, 0041 C, 0, 0040 O, and 0, 0023 N; density 1058 lb ft ⁻² ; dimension 1/2 in. dis. by 6 in. long.	Westinghouse Electric Corp.; 90 Ta, 8 W, and 2 Hf; dimension 1/4 in. dia. by 2 in. long. [Author's design.; T-111].
Rept. Error %	61	
Temp. Range oK	300-2973	300-2672
Ref.	63-1	98°-150
E G	0	٥

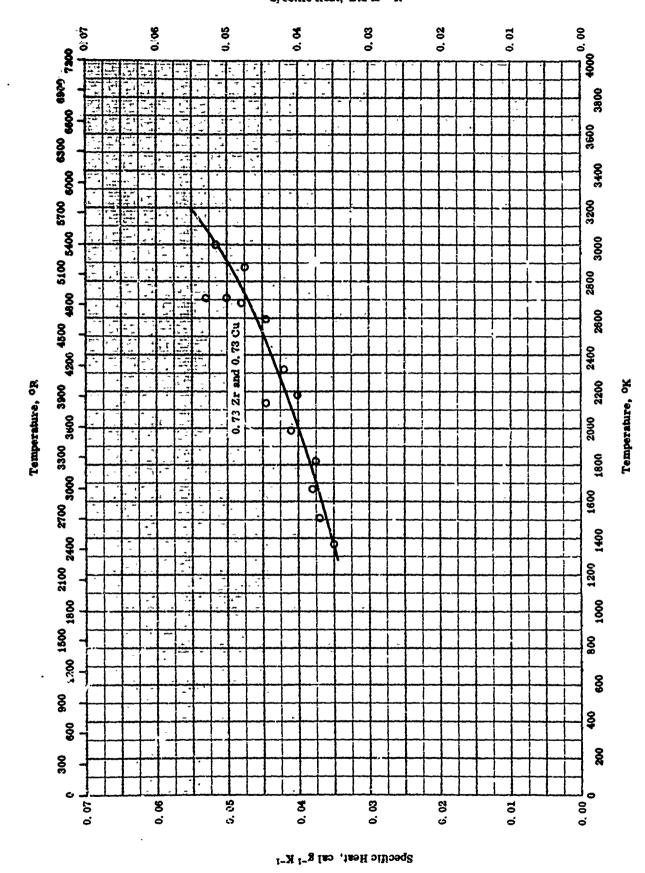
PPOPERTIES OF TANTALUM + ZIRCONIUM + ΣX_i

REPORTED VALUES

Pensity: g cm⁻³ lb i.⁻³
O 0.73 Zr, 0.73 Cu, and 16.66 1040
0.21 Fe

Properties of tangalum + zirconium + zx_1

Nenarke	Sintered, then swaged: letter from authors corrects error in original reference.					
Sample Specifications	0.73 each Zr and Cu, 0.24 Fo, 0.09 NI, 0.08 C, 0.07 Co, 0.03 Mn, 0.02 Si, 0.017 Al, 2.0047 Cr and 0.0033 Cu.					•
Ropt. Bror%						
Temp. Range ok	808					
Ref.	7-99	-		 	 	
Sym South	0				·	

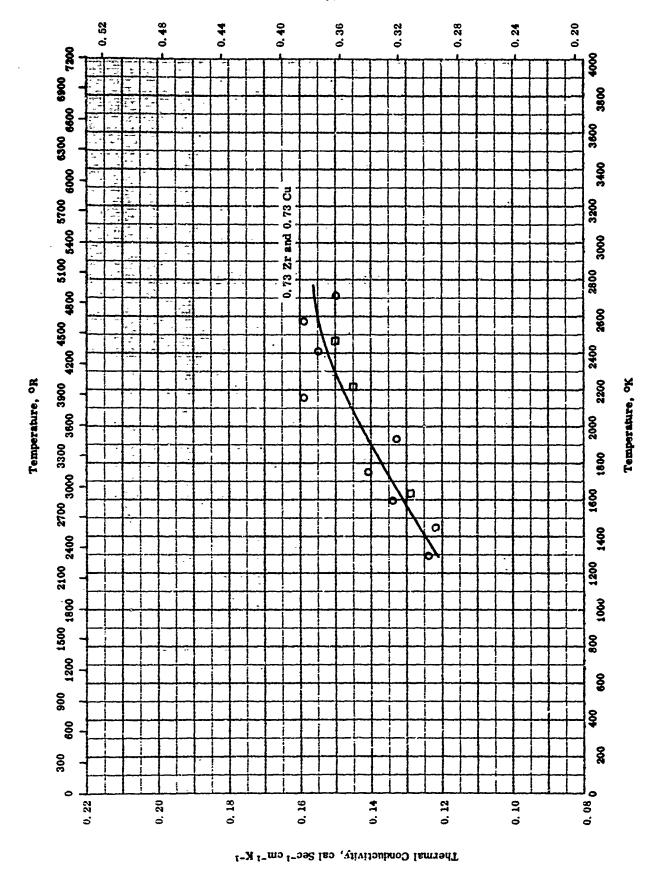


TPRC

SPECIFIC HEART -- TANTALUM + ZIRCONIUM + ZXI

SPECIFIC HEAT -- TANTALUM + ZIRCONIUM + Σx_1

Remarks	Sintered and swaged to given density.
Sample Specifications	Composition before test: 0.73 Zr, 0.73 Cu, 0.21 Fe, 0.09 Mi, 0.08 C, 0.07 Co, 0.03 Mn, 0.02 Si, 0.017 Al, 0.0047 Cr, and 0.0033 Ca, and after test: 0.015 C, 0.013 Si, 0.0023 Cr, 0.0019 Cu, and none of others; density 1040 lb fr ³ .
Rept. Error%	
Temp. Rarge ok	1367-3000
Ref.	999
# B	0

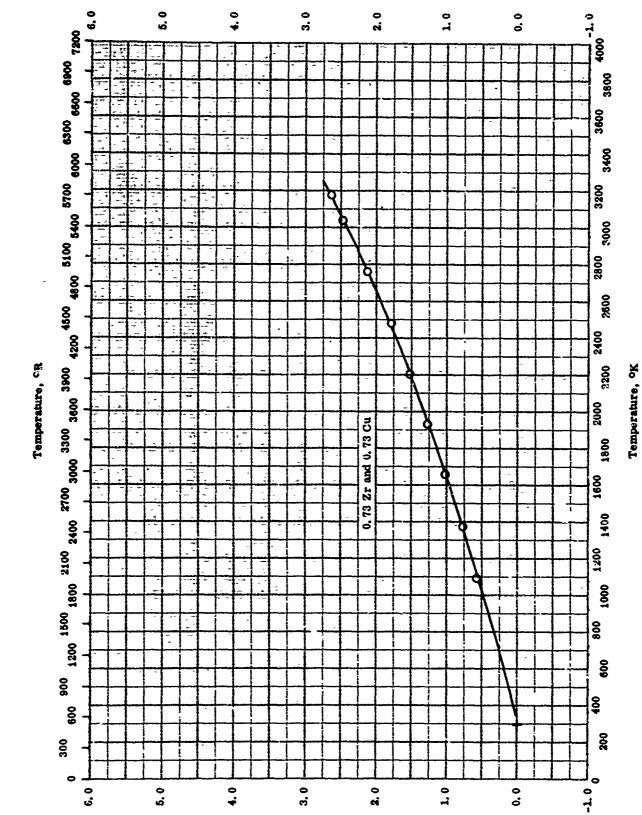


THERMAL CONDUCTIVITY -- TANTALUM + ZINCONIUM + ZXI

TPRC

THERMAL CONDUCTIVITY -- TANTALUM + ZIRCONIUM + ΣX_I

		·····	
Remarks	Sintered; swaged to give density; heating.	Same as above except measured during cooling.	
Suotteofficed algans	Composition before test: 0.73 Zr, 0.73 Cu, 0.21 Fe, 0.09 Ni, 0.08 C, 0.07 Co, 0.03 Mn, 0.02 Si, 0.017 Al, 0.0047 Cr, and 0.0033 Cs; and after test: 0.015 C, 0.013 Si, 0.0023 Cr, and 0.0019 Cu; density 1040 lb ff ³ .	Seme as above.	
Rept. Error%			
Temp. Range ok	1294-2733	1552-2467	
Ref.	567	56-7	
#58 28	0	0	



Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- TANTALUM + ZIRCONIUM + EX

THERMAL LINEAR EXPANSION -- TANTALUM + ZIRCONIUM + EX;

Remarks	Prossed, sintered, and swaged to given density; data shown are smooth.d; taken during second heating and ccoling cycle; letter from author indicates error in original reference which gives density 14. 6 gcm ⁻³ , corrected density 16. 66 g cm ⁻³ .
Sample Specifications	Before test: 0.73 Zr, 0.73 Cu, 0.81 Fe, 0.090 Ni, 0.080 C, 0.070 Co, 0.030 Mn, 0.020 Si, 0.004 Cr, 0.0033 Ca, and no Ti; after test: 0.0150 C, 0.013 Si, 0.0023 Cr, 0.0019 Cu and none of others; density 1040 lb ft ⁻³ .
Rept. Error %	
Temp. Range ok	1089-3172
Ref.	2-99
E Sol	0

PROPERTIES OF THORIUM + URANIUM + ΣX_i

REPORTED VALUES

Melt	ing Point:	ĸ	R
0	28,6 U and 21,4 Zr	1508	2714
O	33,3 U and 33,3 Zr	1477	2659

Properties of thoptum + uranium + Σx_1

Remarks	M. P. by observing the first liquid drop, optical pyrometer sighting on black body cavity.	Same as above.	
Sample Specifications	49.8 Th, 28.6 U, and 21.4 Zr.	33.3 each Th, U, and Zr.	
Kept. Error %			
Tomp. Range ok	1508	1477	
Ref.	50-14	50-14	
ESS ESS ESS ESS ESS ESS ESS ESS ESS ESS	0	D	

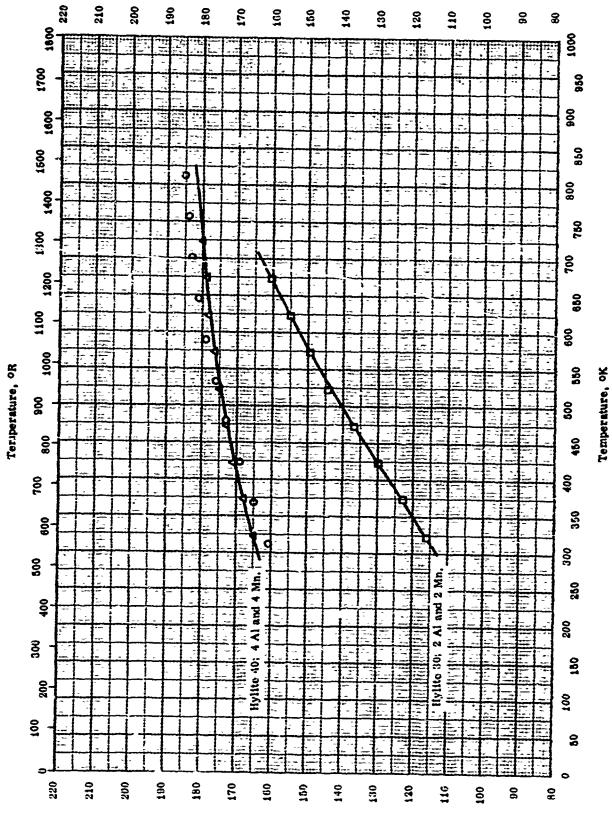
PROPERTIES OF THORIUM + $\dot{\Sigma}X_1$

REPORTED VALUES

Melt	ing Point:	K	R
0	27.6 Zr and 11.0 U	1533	2759
0	25.0 and 17 U	1530	2754
Δ	33.3 Zr and 33.3 U	1744	2659

Properties of thorium + zirconium + Σx_1

Remarks	Observation of first liquid drop.	Same as above.	Same as above.	
Sample Specifications	61.4 Th, 27.6 Zr, and 11.0 U.	58.1 Th, 25.0 Zr, and 16.9 U.	33.3 each Th, Zr, and U.	
Rept. Error %				
Temp. Range ok	1633	1530	1477	
Ref.	50-14	50-14	60-14	
Sym	0		٥	

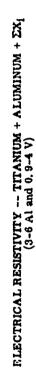


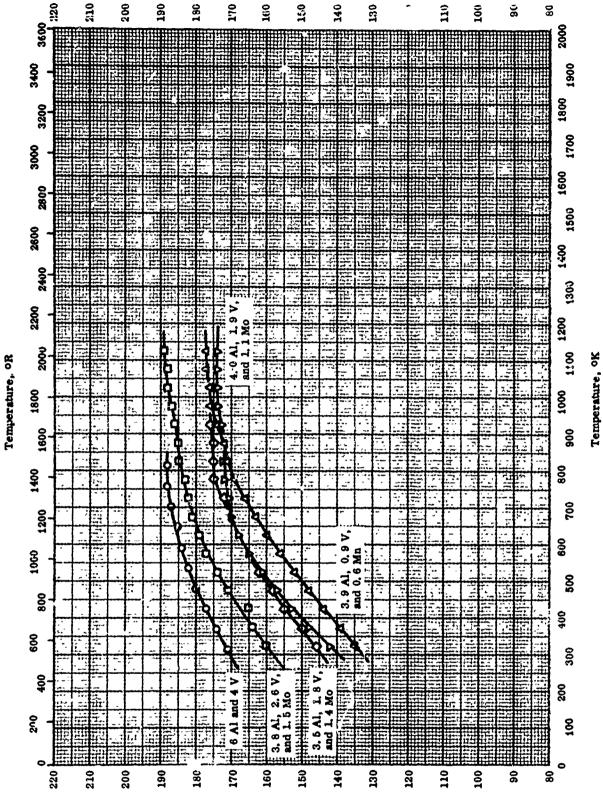
ELECTRICAL RESISTIVITY -- TITANIUM + ALUMINUM + ΣX_1 (2 - 4 A) and 2 - 4 Mn)

Electrical Resistivity, ohm em x 108

Electrical resistivity -- Titanium +Aluminum + ΣX_1 (2 - 4 Alumi 2 - 4 Mn)

Remarko	Mill-amealed.			
Sample Specifications	C-130 AM (Formerly RC-130B); nominal: 4 Al and 4 Mn.	Hyllte 30; 2, e Al, 2, e Mn, and 0, 916 > H2,	Hylite 40: 4.0 Ai, 4.0 Mn, and 6.016 > H2.	
Ropt.				
Yemp.		323-673	029-723	
Rof.	58-14	61-10	01-10	
E S	0		4	



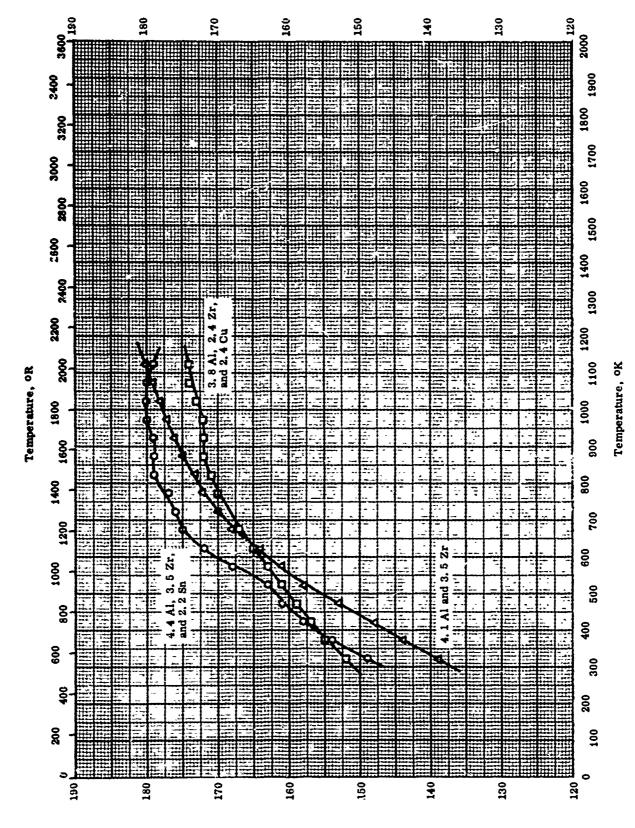


Electrical Resistivity, ohm cm x 10s

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ELECTRICA!, RESISTIVITY -- TITANIUM + ALUMINUM + ΣX_1 (3-6 Al and 0. 9-4 V)

Remarks	Mild annealed.					
Sample Specifications	T1 ·· 6 Al - 4 V; nominal: 6 Al and 4 V.	3.8 Al, 2.6 V, and 1.5 Mo.	3.9 Al, 0.9 V, and 0.6 Mo.	4.0 Al, 1.9 V, and J. 1 Mo.	3.5 Al, 1.8 V, and 1.4 Mo.	
Rept.						
Tenup. Range ^o K		323-1123	323-1123	323-1123	323-1073	
Ref.	58-14	61-11	61-11	61-11	61-11	
Sym	0	C	٥	٥	\Q	



Electrical Resistivity, ohm cm x 106

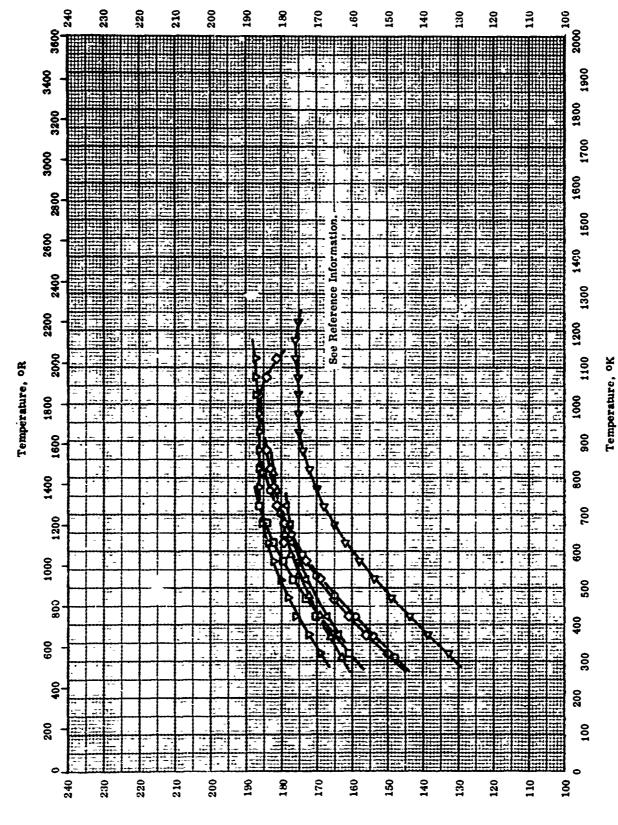
TPRC

ELECTRICAL RESISTIVITY -- TITANIUM + ALUMINUM + ΣX_1 (3. 8-4. 4 Al and 2. 4-3. 5 Zr)

ELECTRICAL RESISTIVITY -- TITANIUM + ALUMINUM + ΣX_l (3, 8-4, 4 Al and 2, 4-3, 5 Zr)

				 	 	 	 			 	 _
Remarks											
Sample Specifications	4.4 Al, 3.5 Zr, and 2.2 Sn.	3.8 A1, 2.4 Zr, and 2.4 Cu.	4. 1 Al and 3. 5 Zr.								
Rept. Error%											
Temp. Range oK		323-1123	323-1123		 	 	 		·		
Ref.	61-11	61-11	61-11								:
Sym	0		٥								

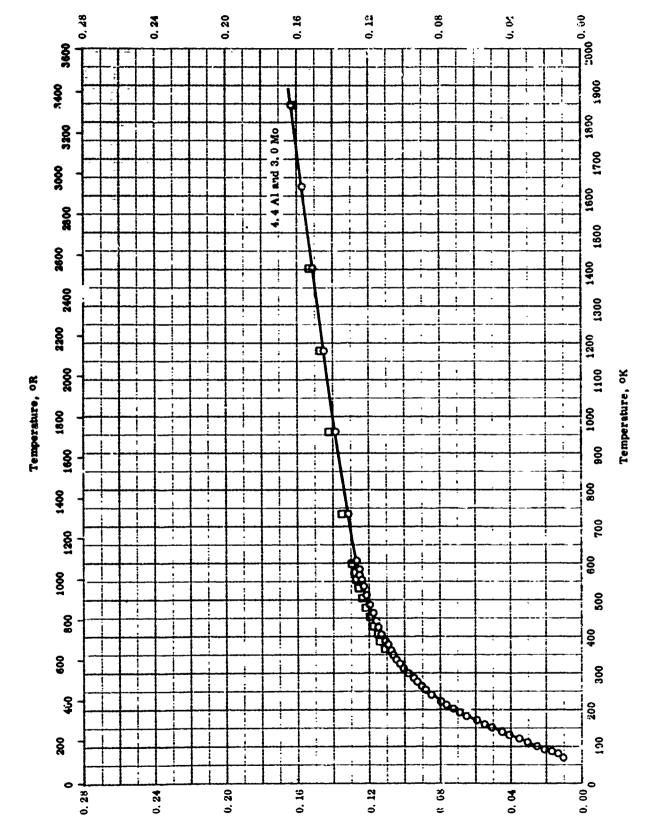
ELECTRICAL RESISTIVITY -- TITANIUM + ALUMINUM + ΣX_1



Electrical Resistivity, ohm cm x 106

ELECTRICAL RESISTIVITY -- TITANIUM + ALUMINUM + Σx_1

T								
Remarks	In a mild-annealed condition.						in a mild-unnealed condition.	
Sample Specifications	A-110 AT; nominal: 6 Al and 2.6 Sn.	Hyllte 20; Al, 2, 5 Sn, and 0, 015 > H2.	Hyllte 50; 4,0 Al, 4.0 Mo, 2.0 Sn, 0.5 Sl, and 0.015 > H2.	3.8 Al, 2,7 Sn, and 2,2 Cu,	3.7 Al, 2,5 Sn, and 2.1 V.	4.0 Al and 1.5 Mo.	Ti-166 A: nominal: 6 Al. 1, 5 Fe, 1, 4 Cr, und 1,2 Mo.	
Rept. Error %	#						F 1	
Temp. Range ok	311-811	723-723	323-723	323-1123	323-1123	323-1223	311-811	
Ref.	58-11	61-10	61-10	61-11	61-11	61-11	58-14	
E S	0	0		→	♦	▽	Δ	



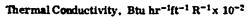
SPECIFIC HEAT -- TITANIUM + ALUMINUM + ΣX_1

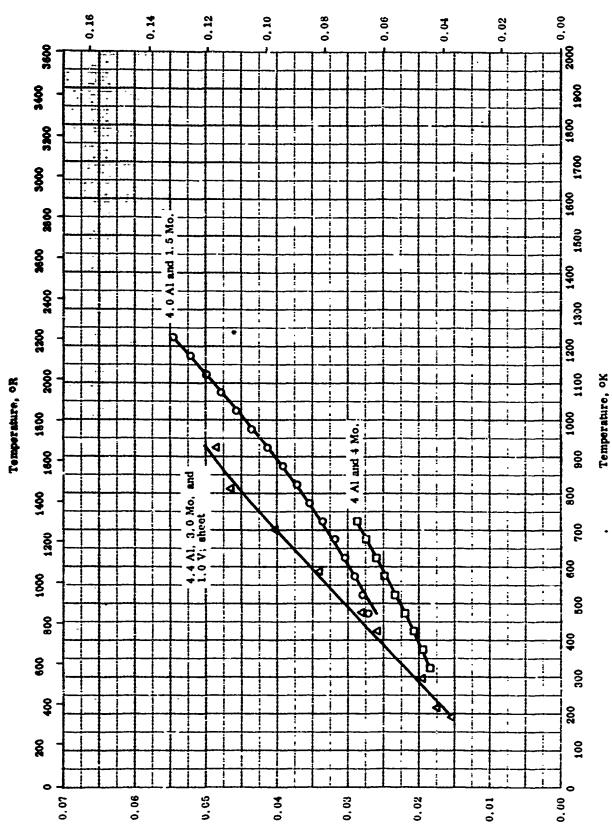
Specific Heat, cal g-1 K-1

SPECIFIC HEAT -- TITANIUM + ALUMINUM + EXI

₹ ,

Γ^{γ}		
Remarks	Solution heat treated at 1655 F and age, at 925 F for 12 hrs.	Solution heat treated at 1000 F for 4 hrs and then cooled in air.
Sample Specifications	4 Al-3 Mo-1 V titanium alloy; 4, 4 Al, 3.0 Mo, 1.0 V, 0.10 Fe, 0.03 C, 0.011 N ₂ , and 0.0057 H ₂ .	6 Al-4 V titanium ulloy; 5. 89 Al, 3. 87 V, 0. 15 Fe, 0. 02 C, 0. 015 N ₂ , and 0. 0050 H ₂ .
Ropt. Error %	o	୦ ଖ ୪
Temp. Range ok	80-1800	80-1800
Rof.	61-17	61-17
25 150 100	0	0



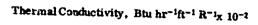


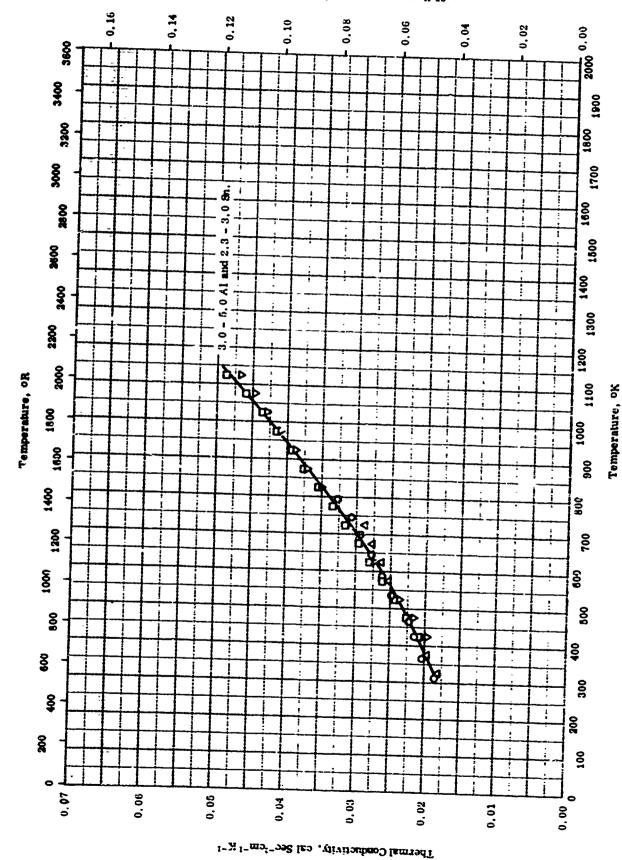
THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + ΣX_1 (4.0-4.5 Al and 1.5-4.0 Mo)

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}K^{-1}$

THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + Σx_i (4.0-4.5 Al and 1.5-4.0 Mo)

Remarks							
Sample Specifications	4.0 Al and 1.5 Mo.	Hylite 60 from Jessop-Saville LTD.; 4 Al. 4 Mo, 2 Sn, 0.6 Si, and 0.015 H ₂ .	Crucible heat no. R 6736 sheet no. B-32; 4.4 Al, 3.0 Mo. 1.0 V, 0.1 Fe, 0.03 C, 0.011 N ₂ . and 0.0057 H ₂ .				
Ropt. Error%							
Temp. Rango ok	473-1223	323-723	190-922				
Ref.	61-11	61-10	62-11				
Sym	0	0	4				

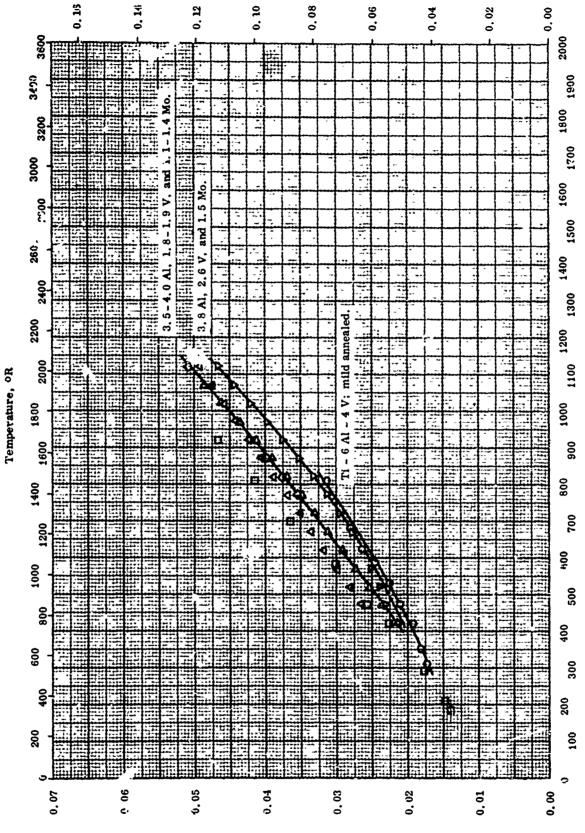




THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + ΣX_1 (3.0-5.0 Alumid 2.0-3.0 Bh)

THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + EX. (3 0-5.0 A) and 2.0-3.0 en)

Nemarks	In a mild unnealed condition.										
Bample Specifications	A - 110 AT; 6 At ant 2, 6 Bn; nominal composition.	3.7 Al, 2.6 8n, and 2.1 V.	Hyllu 20 from Jessop-Saville L'fid.; 5 Al, 2.5 Sn, and 0.016 H2.	3.8 Al. 2.7 M., and 2.2 Cu.							
Rept,	υ #										
Temp. Range OK	311-611	423-1123	323-723	429-1129							
Ref.	68-14	61-11	01-10	61-11							
, <u>\$3</u>	0	0	٥	۵		 	 			<u>.</u>	



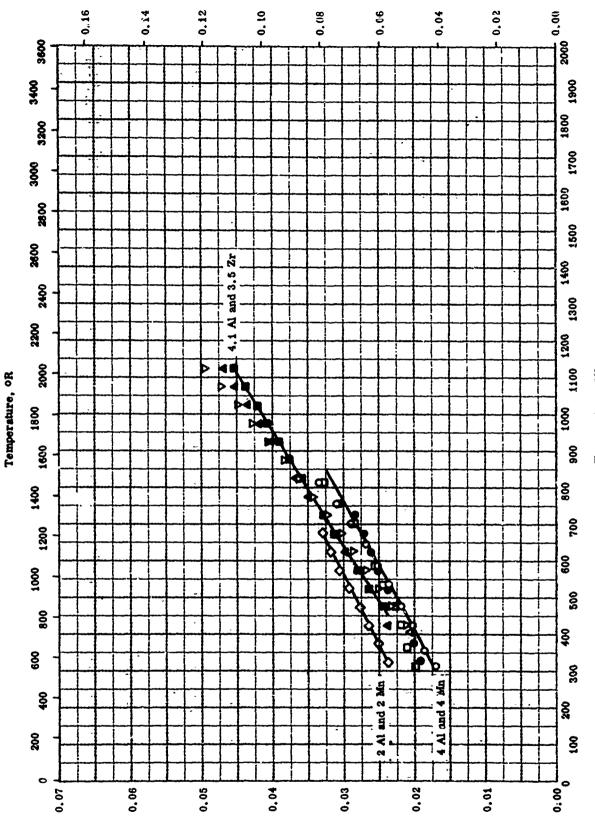
THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + ΣX_1 (3,5-6,0 A) and 0.9-4.0 V)

Temperature, ^{oK}

Thermal Conductivity, cal Sec⁻¹ cm⁻¹ K⁻¹

THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + ΣX_1 (3.5-6.0 Al and 0.9-4.0 V)

Remarks	In a mild annealed condition.						
Sample Specifications	T' - 6 Al - 4 V.	Ti - 6 Al - 4 V sheet no. 1777 A-1; 5.89 Al, 3.87 V, 0.15 Fe, 0.02 C, 0.015 N ₂ , and 0.005 H ₂ .	3.9 Al, 0.9 V, and 0.6 Mo.	3.8 Al, 2.6 V, and 1.5 Mo.	3.5 Al, 1.8 V, and 1.4 Mo.	4.0 Al, 1.9 V, and 1.1 Mo.	
Rept. Error%	£						
Temp. Range ^o K	311-811	188-922	473-1123	473-1123	423-1073	423-1123	
Ref.	58-14	62-11	61-11	61-11	61-11	61-11	
E S	0	۵	٥	۵	Δ	 \tau \tau \tau \tau \tau \tau \tau \tau	



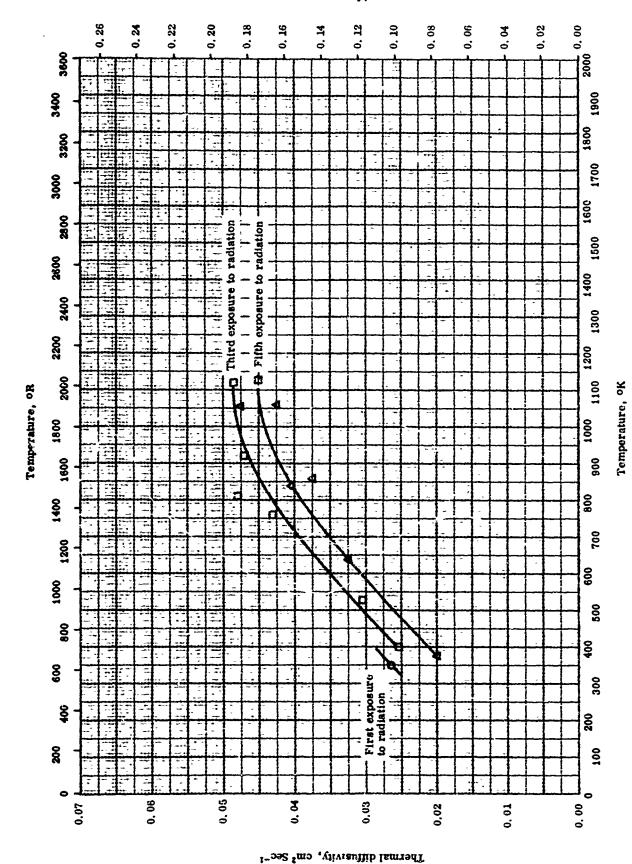
Thermal Conductivity, cal Sec-1 cm-1 K-1

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THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + ΣX_1

THERMAL CONDUCTIVITY -- TITANIUM + ALUMINUM + $\Sigma X_{\mathbf{I}}$

E O	Ref.	Temp, Range ok	Rept. Error %	Sample Specifications	Remarks
0	58-14	İ	£ 5	C - 130 AM (formerly RC - 130B); 4 Al and 4 Mn; nominal com- in a mild annealed condition.	In a mild annealed condition.
0	58-14	311-811	# 22	5 Al. 1.5 Fe, 1.4 Cr. and 1.2 Mo; nominal compo-	Same as above.
				sitton.	
٥	58-14	408		7 Al and 0.5 Si.	
٥	61-11	423-1123		4.4 Al, 3.5 Cu, and 2.2 Sn.	
\(\)	61-10	323-673		Hylite 30 from Jessop-Saville L'fD.; 2 Al, 2 Mn, and 0.015 H ₂ .	
•	6110	323-723		Hylite 40 from Jessop-Saville LTD.; 4 Al, 4 Mn, and 0.015 H ₂ .	
•	61-11	423-1123		4. 1 Al and 3. 5 Zr.	
4	61-1:	423-1123		3.8 Al, 2.4 Zr, and 2.4 Cu.	

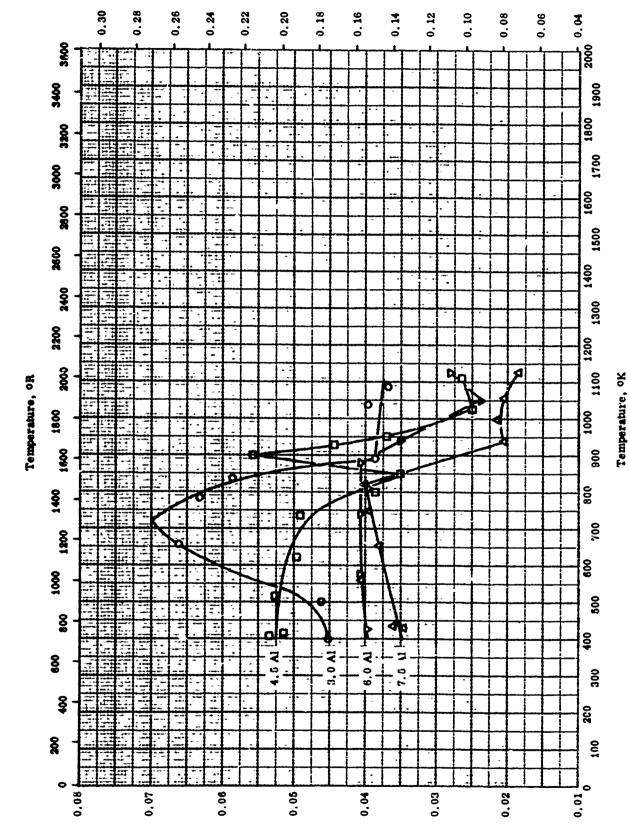


THERMAL DIFFUSIVITY -- TITANIUM + ALUMINUM + ΣX_1 (6 A1 - 4 V)

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THERMAL DIFFUSIVITY -- TITANIUM + ALUMINUM + ΣX_1 (6 Al - 4 V)

Remarks	Exposed to radiation and followed by cooling.	Measured after three exposures to radiation.	Measured after five exposures to radiation.	
Sample Specifications	6 Al-4 V; nominal composition.	Same as abov	Same as above.	
Rept. Error %				
Temp.		398-1123	373-1058	
Ref.	67-1	57-1	57-1	
Sym	0	٥	٥	

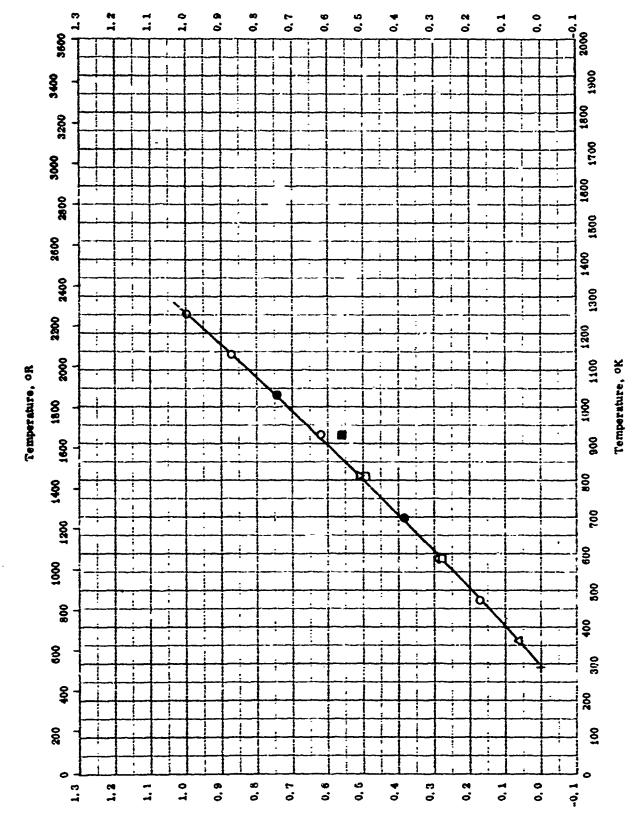


Thermal diffusivity -- Titanium + aluminum + $\Sigma x_{
m i}$

Thermal diffusivity, cm! Sec-1

THERMAL DIFFUSIVITY -- TITANIUM + ALUMINUM + EXI

Remarko	Vacuum annealed for 5 hrs at 720 C and again annealed in the apparatus before beginning measurement.	Same as above.	Same as above.	Same as above.
Sample Specifications	3.0 Al and 2.5 total Cr. Fo. St. and B; cylindrical sample with 3 mm dia and 300 mm long.	4. 6 Al and 2. 5 total Cr. Fe, St. and B; same dimensions as above.	6.0 Al and 2.5 total Cr. Fc. St. and B; same dimensions as above.	7.5 Al and 2.5 total Cr, Fc, St, and B; same dimensions as above.
Error%				
Range ok	396-1083	4031110	428-1126	423-1123
Ref.	62-2	62-2	2-2	8 8 8
53	0	0	٥	D

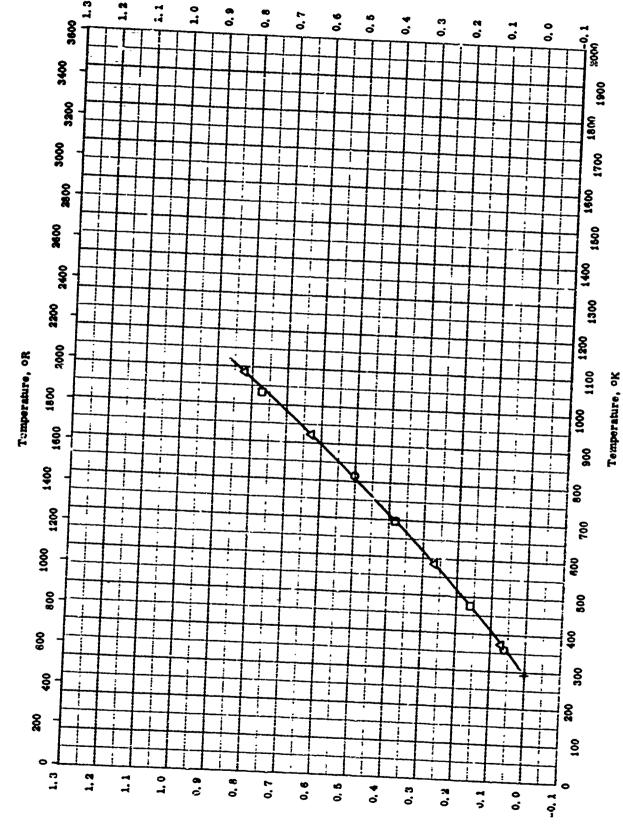


Thermal linear expansion -- Titanium + aluminum + Σx_1 (6 < al < 8)

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- TITANIUM + ALUMINUM + ΣX_1 (5 & A) < 8)

Remarks							Fully annealed at 1650 F for 1 hr and air-cooled; stress relief at 1003 – 1200 F for 1/4 – 1 hr and air-cooled; forging blocking at 1850 – 1950 F and finishing 1800 – 1850 F.
Sample Specifications	Crucible A-110 AT; 5 M and 2,5 Sn; nominal composition.	6 Al and 2.6 Sn; density 4, 46 4, 48 g cm ⁻³ ; alpha phase.	Same as above except low oxygen content.	5 A1, 2.75 Cr, and 1,25 Fo; donsity 4,48 - 5,51 g cm ⁻³ ; alphabeta alloy.	5 Al, 1.5 Fe, 1.4 Cr, and 1.2 Mo; density 4.48 - 4.51 g cm ⁻³ ; alpha-beta alloy.	A110 AT; 5 Al and 5 Sn.	RMI - 7 Ai - 2 Nb - 1 Ta; Reactive Metals, Inc.; 6.6 - 7.3 Ai, 3 Nb, 1 Ta, 0.20 Fe, 0.080 O, and 0.04 C; density 0.160 lb in. 3 and approx melting point 3000 F; alpha alloy with beta transus 1880 ± 25 F.
Rept. Error%							
Tomp, Range oK	203-1266	293-811	203-811	293-811	203-811	293-1144	273-932
Ref.	68-31	63-20	63-29	63-20	63-20	64-33	9-99
E OG	0	0	٥	D	\lambda	•	



THERMAL LINEAR EXPANSION -- TITANIUM + ALUMINUM + $\Sigma X_{\rm I}$ (3.5-4.6 Al and 3.5-4. F M1)

Thermal Linear Expansion, percent

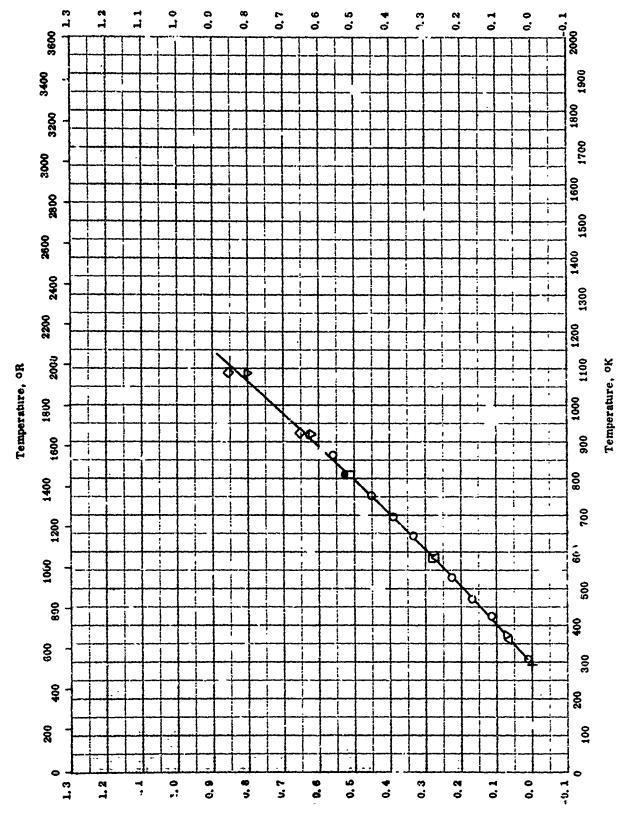
Thermal linear expansion -- Titanium + aluminum + Σx_{i} (3.6-4.6 Ai and 3.6-4.6 Mn)

REFERENCE INFORMATION

Romarks			
Sample Specifications	4 Al and 4 Mini density 4.5118 g cm ⁻³ ; ulpha-beta body.	RC-130 D; 4 Al and 4 Mn.	RMI - 4 Al 4 Mn; Reactive Metals, Inc.; 3.5 - 4.5 Al, 3.5 - 4.5 Mn, 0.40 Fe, 0.20 O. 9.08 G, 0.04 Nl, and 0.0100 - 0.0125 H; density 0.103 lb in; 3 and approx melting point 3000 F; alpha-bota alloy with beta transus 1750 ± 25 F.
Rept.			
Temp.	290-811	203-1033	273-1089
Ref.	03-20	04-33	99-99 9-99
Too.	0	0	٩

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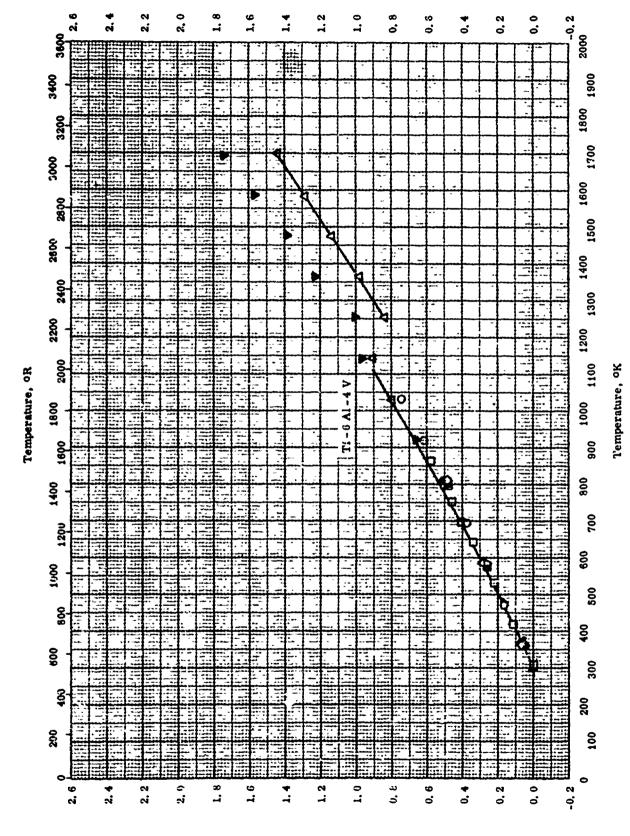
THERMAL LINEAR EXPANSION -- TITANIUM + ALUMINUM + ΣX_1 (3 - 8 Al and 1 - 5 Mo)

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THERMAL LINEAR EXPANSION -- TITANIUM +ALUMINUM + ΣX_1 (3-8 Al and 1-5 Mo)

Sample Specifications Remarks	Crucible (heat No. R6736 and sheet No. B-32); 4.4 Al, 3 Mo, 1.0 V, 1.0 Fe, 0.03 C, 0.011 N, and 0.0057 H; sample 0.1 in. in dia and 1.968 in. in length. Machined from 0.125 in. sheet parallel to grain direction: solution treated at 1655 F for 15 - 30 min, oll-quenched, aged at 925 F for 12 hrs, and atr-cooled; average data of three samples.	4 Al, 3 Mo, and 1 V; density 4.5118 g cm ⁻³ ; alpha-beta body.	7 Al and 4 Mo; density 4.48 g cm ⁻³ ; alpha-beta body.	RMI - 4 Al - 3 Mo - 1 V; Reactive Meatls, Inc.; 3.75 - 4.75 Al, 2.3 - 3.5 Mo, 0.5 - 1.5 V, 0.25 Fe, 0.08 C, 0.05 N, and 0.015 H 'lensity 0.163 lb in: 3 and approx molting temperature	HMI 7 Al - 4 Mo; Reactive Motals, Inc.; 6,5-7.3 Al, 3.4 - Fully amerlod at 1500 F for 1 hr, furnace-cooled 4.5 Mo, 0.25 Fe, 0.05 C, 0.05 N, and 0.0100 - 0.0125 H; to 1050 F, and air-cooled; stress relicf at 1300 density 0, 162 lb in. and approx melting point 3000 F; alphabeta body with beta transus 1840 ± 25 F.	8 Al, 1 Mo, .nd 1 V; density 4.3734 g cm ⁻³ ; alpha phase.
Rept. Error%	რ V					
Temp. Range ok	311-922	298-811	298-811	273-1089	273-1089	283-811
Ref.	62-28	63-29	63-29	65-6	9-29	63-29
Sym	0		٥	D	¢	•

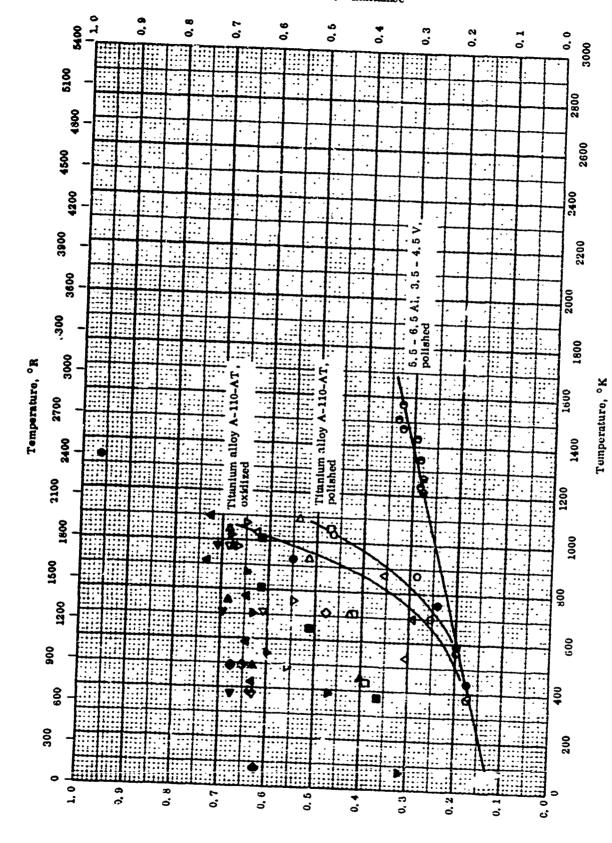


THERMAL LINEAR EXPANSION -- TITANIUM + ALUMINUM + Σx_1 (2 - 8 Al and 1 - 6 V)

Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- TITANIUM +ALUMINUM + ΣX_l (2 - 8 Al and 1 - 6 V)

Remarks		Machined from 0, 125 in, thick sheet parallel to grain direction, solution treated at 1700 F for 20 min, oil-quenched, aged at 900 F for 4 hrs, and air-cooled; average data of three samples with permanent expansion from 0,011 - 0,025%,					Fully annealed at 1300 F for 1 hr., air cooled, stress relief at 1300 F for 1 hr and air-cooled.	Annealed; measured in vacuum of about 3×10^{-4} mm Hg; beta transus temperature 1825 F; heating.	Cooling data of the above sample.
Sample Specifications	Crucible C-120 AV; 6 Al and 4 V; density 0.160 lb in. 3 and melting range 2786 - 2976 F.	Reactive metals (heat No. 32167 and sheet No. 1777A-1); 6.03 Ai, 4.0 V, 0.15 Fe, 0.043 C, 0.009 N, 0.0800 O, and 0.0063 H; rample 0.1 in. in dia and 1.968 in. in length.	8 Al, 1 V, and 1 Mo; density 4.3734 g cm ⁻³ ; alpha phase.	6 Al and 4 V; density 4, 43 g cm ⁻³ ; alpha-beta alloy.	Same as above; low carbon content.	6 Al, 6 V, 2 Sn, and 1 Fe and Cu; density 4.54 g cm ⁻³ and alpha-bets alloy.	RMI - 3 Al - 2.5 V from Reactive Metals, Inc.; 2.5 - 3.5 Al, 2.0 - 3.0 V, 0.30 Fe, 0.12 O, 0.05 C, 0.02 N, and 0.0125 - 0.0150 H; density 0.162 lb in. and approximate melting 3100 F; alpha-beta alloy.	Ti - 6 Ai - 4 V; prepared from 140 Bhn sponge; sample 5/8 in. dia rod; melting point 2900 F.	Same as above.
Rept. Error%									
Temp.	293-1033	311-922	283-811	293-811	293811	2611	2730) 1	293-1700	293-1700
Ref.	63-31	62-28	62-29	63-29	63-28	63-59	9-99	61-30	61-30
Sym	0	0	٥	•	♦	8	<	٥	Þ



Normal total emittance -- titanium + aluminum + $\Sigma x_{\underline{t}}$

Normal Total Emittance

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NORMAL TOTAL EMITTANCE --- TITANIUM + ALUMINUM + ΣX_1

Remarks	Polished; measured in air; cycle 1.	The above specimen; cycle 2 heating.	The above specimen; cycle 2 cooling.	The above specimen; cycle 3.	Oxidized at 922 K for 30 min.; measured in air; cycle 1.	The above specimen; cycle 2.	The above specimen; cycle 3 heating.	The above specimen; cycle 3 cooling.	Polished; measured in air; cycle 1.	The above specimen; cycle 2 heating.	The above specimen; cycle 2 cooling.	The above specimen; cycle 3.	Oxidized at 922 K for 30 min.; measured in air;	The above specimen; cycle 2.	The above specimen; cycle 3 heating.	The above specimen; cycle 3 cooling.	
Sample Specifications	Titanium alloy A-110-A'T; nominal: 5 Al and 2.5 Sn.	Same as above.	Samo as abcvo.	Same as above.	Titanium alloy A-110-AT.	Same as above.	Same as above.	Same as above.	90 Ty, 6 Al, and 4V.	Same as above.	Same us above.	Same as above.	90 Ti, 6 Al, and 4 V.	Same as above.	Same as above.	Same as above.	(continued onto next page)
Rept. Error%			•														
Temp. Range ok	80-1033	436-1047	108	446-1089	383-1028	483-1064	376-978	78-486	78-922	375-1011	310	422-1086	75-1019	486-1039	376-976	469	
Ref.	58-25	58-25	58-25	58-25	58-25	08-26	ŏ8⊷25	58-25	58-23	58-26	58-25	58-25	58-25	58-26	58-26	58-25	
\$ 100 \$ 100	0	0	\lambda	Δ	٥	Þ	Δ	•	•	•	•	4	•	A	▼	♦	

NORMAL TOTAL EMITTANCE -- 'TITANIUM + ALUMINUM + EX, (Continued)

Remarks	Polished; measured in a vacuum of 3 – 4 µ Hg; heating.	
Sample Specifications	5.5 - 6.5 Al. 3.5 - 4.5 V, 0.1 max, C, 0.3 max, Fe, 0.05 max, Polished; measured in a vacuum of 3 - 4 m Hg; N2, 0.0125 max, H2, and 0.15 max, O2; surface regimens: 2 - 3 m RMS.	
Rept. Error%		
Temp. Range ox	1233-1566	1216-1333
Ref.	63-21	
ESS SCIENCE SC	5	•

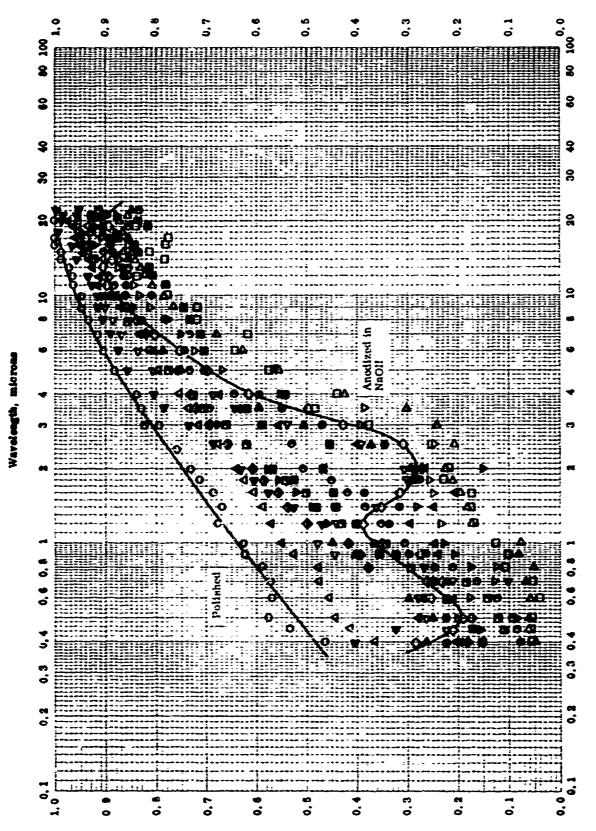
normal spectral emittance ... Titanim + aluminum + \mathbf{x}_i

NORMAL SPECTRAL EMITTANCE -- TITANIUM + ALUMINUM + EX

# 5 6 2	Ref.	Wavelength	Temp. ok	Rept.	Sample Specifications	Remarks
٥	67-48	0, 065	1133-1660		Tiunfum alloy A-110-AT; nominal: 6 Al, and 2, 5 Sn.	Measured in vacuum; same data for as re- ceived and cleaned (with a liquid detergent).
0	17-48	0,665	1211-1058		Same an above.	Polished with fine polishing compounds: measured in vacuum.
٥	67-48	0, 665	1130-1666		Same ar sbove.	Oxidized in air at red heat for 30 min. ; mossured in vacuum.
\(\)	6748	o, ass	1147-1686		90 Ti, 6 Al, and 4 V.	Measured in vacuum; same data for as re- ceived and cleaned (with a liquid detergent).
D	57-48	0, 665	1164-1601		Sume ан аbove.	Polished with fine polishing compounds: measured in vacuum.
Δ	37-48	0, 605	1133-1666		' ame as abovo.	Oxidized in air at red heat for 30 min. : mensured in vacuum.
▽	69-21	0.03	1230-1566		5,5 - 6,5 Al, 3,5 - 4,5 V, 0,1 max, C, 0,3 max, Fe, 0,06 max, N ₂ 0,0126 max, H ₂ , ard 0,16 max, O ₂ , ниг- face roughness: 2 - 3 \to MMS,	Polished; measured in vacuum (3 - 4 µ Hg); henting.
•	. 1 2 - 139	0,65	1210-1333		Same as above.	The above specimen; cooling.
				-		







Wavelength, microne

NORMAL SPECTRAL REFLECTANCE -- TITANIUM + ALUMINUM + ΣX_1 (Titanium alloy A-110-AT)

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Normal Spectral Reflectance

NORMAL SPECTRAL REFLECTANCE -- TITANIUM + ALUMINUM + ΣX_1 (Titanium alloy A-110-AT)

0 01-22 0 01-22 0 01-22 0 01-22 0 01-22 0 01-22 0 01-22	80 8 02 00 00	0.4-22			The state of the s
61-22 61-22 61-22 61-22 61-22 61-22 61-22 61-22			······································	Titunium alloy A-110.AT; nominal: 6 Al and 2, 6 Sn.	Mechanically and electropolished; 10-1
61-22 61-22 61-22 61-22 61-22 61-22 61-22		0.4-20		Titunium alloy A-110-AT.	Mechanically polished: 10-5 mm Hg vacuum,
61-22 61-22 61-22 61-22 61-22		0.4-21.0	-	Titantum alloy A-110-AT.	Mechanically polished; pickled, anodized in NaOii, and scaled; 10 ⁻⁸ mm Hg vacuum; 0, 4 x 10 ⁻⁴ cm thick coating.
61-22 61-22 61-22 61-22	22.2	0,4-21.0		Same as above.	The above specimen measured at 422 K.
61-22 61-22 61-22 61-22	989	0.4-21.0		Same as above.	The above specimen measured at 589 K.
61-22	765	0, 4-19, 0		Same as above.	The above specimen measured at 755 K
61-22	208	0, 4-22, 0		Same as above.	The above specimen after previous high temperature runs.
61-22	208	0.4-22.0		Titunium ulloy A-110-AT,	Mechanically and electropolished; oxidized in NaOH, and sealed; 10 ⁻⁵ mm Hg; 0, 4 x 10 ⁻⁴ cm thick coating.
	833	0.4-22.0		Same as above.	The above specturen measured at 633 K.
0 01-22	H11	0,4-23,0		Запе вы вроуе.	The above specimen measured at 811 K.
01-22	208	0, 4-22, 0		Same as above,	The above specimen after the previous run,
01-22	978	0.4-22.0		Same as above.	The above specimen measured at 978 K.
01-22	20E	0, 4-22, 0		Same as above.	The above specimen after the run at 978 K.
				(continued onto next page)	

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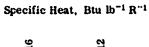
NORMAL, SPECTHAL REFLECTANCE -- TITANIUM + ALUMINUM + ΣX_1 (Continued) (Thunlum alloy $\Lambda - 110$ - ΛT)

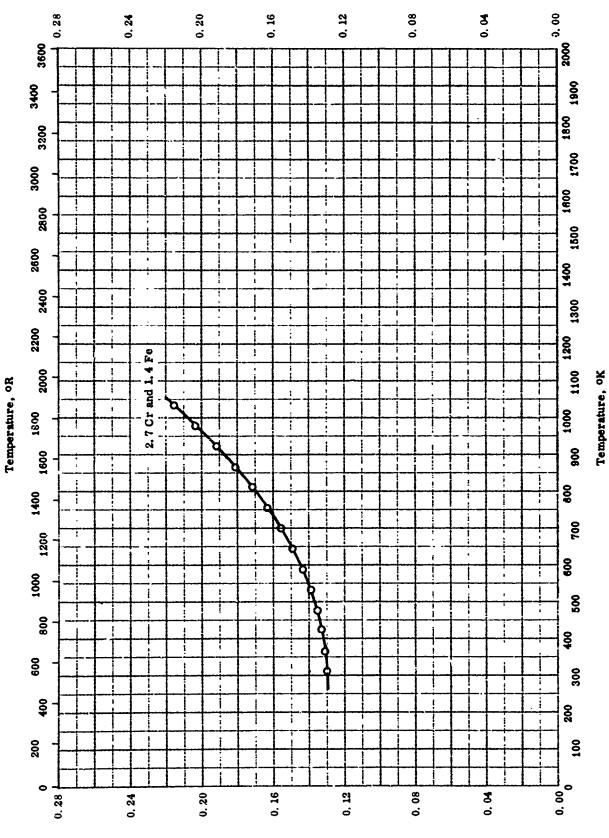
REFERENCE INFORMATION

2.3	7.6 1,	Tump. OK	Wavelungh	Rept.	Sample Specifications	Remarks
A	61-42	¥07	0, 4-22, 0		Запіє ви вроус.	Mechanically and electropolished; anodized in NaOH 1/3 standard time, and scaled; 10 ⁻¹ mm Hg vacuum; 0.4 x 10 ⁻⁷ cm thick conting.
▼	61-22	202	0, 4-32, 0		Titanium alloy A-110-AT; nominal: 5 Al and 2, 5 Sn.	Mechanically and chectropolished, anodized in sulfurfe acid, and sealed; 10 ⁻⁴ nm Hg vacuum; 0, 4 x 10 ⁻⁴ cm thick conting.
>	2 2 1 2 1	20 20	0. 4-22.0		Titanium alloy A-110-AT.	Mochanically polished, pickled, anodized in sulfurio noid, and avaled; 10 ⁻⁵ mm lik vacuum; 0,4 x 10 ⁻⁴ cm thick coating.

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Specific heat -- titanium + chromium + Σx_i

Specific Heat, cal $g^{-1} K^{-1}$

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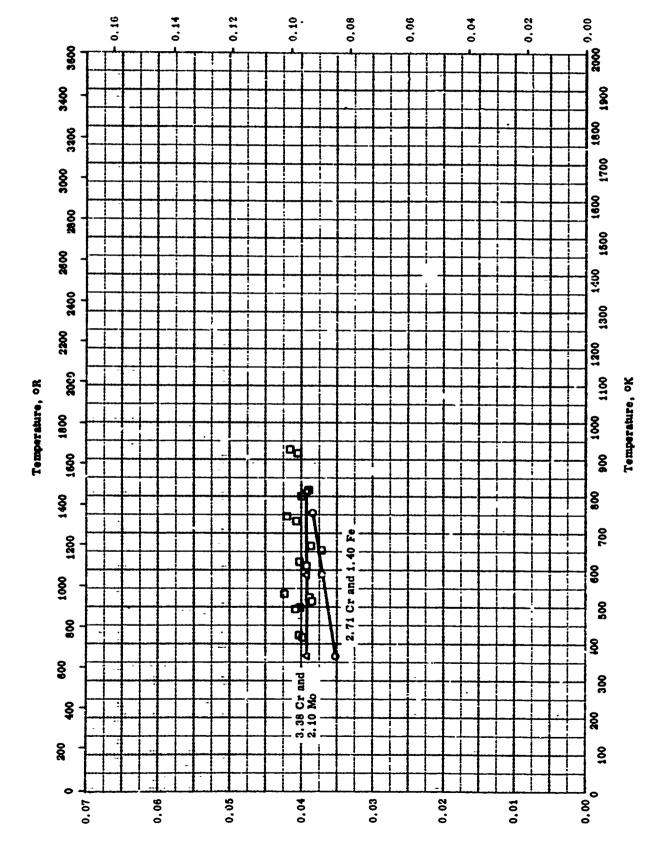
Specific heat -- titanium + chromium + Σx_i

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Remarks	
Sample Specifications	95. 65 Ti, 2.71 Cr, 1.40 Fo, 0.106 O ₂ , 0.076 N ₂ , 0.05 C, and 0.0092 H ₂ .
Rept. Error%	
Temp. Range ok	311-1033
Ref.	6-99
Solin Solin	0

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Thermal conductivity -- titanium +chromium + Σx_i

Thermal Conductivity, cal Sec-1 cm-1 K-1

THERMAL CONDUCTIVITY .- TITANIUM + CHROMIUM + Σx_i

REFERENCE INFORMATION

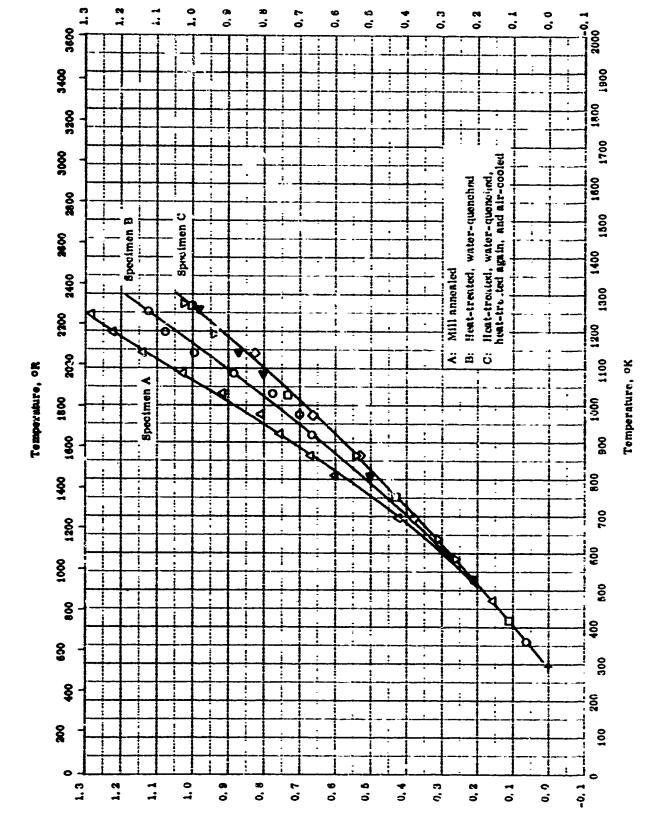
רַ ק				
Remarks				
Sample Specifications	Ti 150 A(2): 95.65 Ti, 2.71 Cr, 1.40 Fo, 0.105 O ₂ 0.076 N ₂ , 0.05 C, and 0.0092 H ₂ ,	Cr - Mo; 96.30 Ti, 3.38 Cr, 2.10 Mo. 0.131 O ₂ , n 13 Fe, 0.032 N ₃ , 0.02 C, und 0.0077 H ₂ .	Ti 150 (A); composition not given.	
Rapt. Error%	10	2	01	
Temy.	367-756	367- 11	418-927	
Ref.	6-99	56-9	0-99	
Som Dog	0	4	0	

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Thermal linear expansion -- Titanium + Chromium + Σx_{\parallel}

Thermal Linear Expansion, percent

REFERENCE INFORMATION

THERMAL LINEAR EXPANSION ... TITANIUM + CHROMIUM + EX

Romarka	Mill nanculed; meanured under the prensure of approx 0, 8 micron with a heating rate of 1 F min ⁻¹ ; first run,	Second run of above specimen: vacuum-cooled,	Heat treated at 1700 F for 10 min, and then water quenched; measured under the preasure of approx 0, 8 mieron with a heating rate of 1 F min"; first run,	Second run of above specimen; encuum-ecoled,	Heav-treated at 1700 F for 10 min, water-quenched, and heat-treated again at 1900 F for 28 hrs, and then air-cooled; tested ander the same condition as above; first run,	Second run of above specimen; vacuum-cooled,	1469
Sample Specifications	Obtained from Mallory - Sharon Titanium Corp.; 4, 94 Cr., 3, 47 Al, 0, 25 Fe, 0, 00 C, 0, 036 N, and 0, 0244 H; dimension 0, 25 in, dia by 1, 75 in, long. [Author's design,: Specimen A],	Same PR above,	Same as Abovo. [Author's design.: Specimen B].	Sume as above.	Same as above. [Author's design,: Specimen Cj.	Same as above.	The second desired in the second seco
Rept.							ner e e e e e e e e e e e e e e e e e e
Temp. Runge ok	208-1266	20K-1272	20a-1243	208-1378	208-1264	208-1264	A THE REPORT OF THE PROPERTY O
Ref.	64-32	58-32	58-32	58-32	58-32	D&-:32	HONCKEN AND AND AND AND AND AND AND AND AND AN
Segment of the segmen	0	0	٥	D	\Q	V	

Froperties of titanium + iron + Σx_i

REPORTED VALUES

Density: g cm⁻³ lb ft⁻³
O i.11 Fe and 1.05 Si 4.544 283.7

Properties of titanium + inon + $\mathbb{E}x_1$

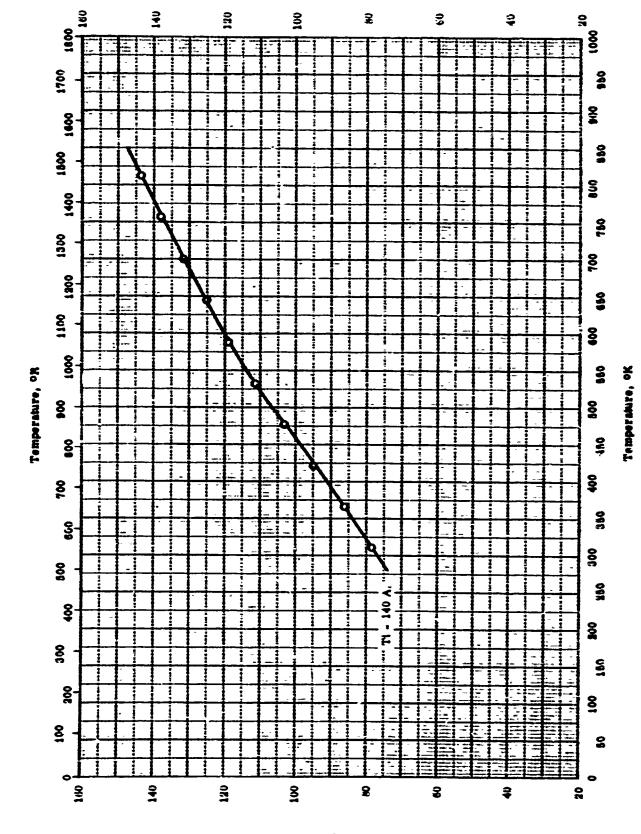
REFERENCE INFORMATION

Remarks	
Sample Specifications	1.11 Fe, 1.05 61, 0.22 C,0.2> Cu, 0.2> Nb, 0.17 V, and 0.01 Mn.
Rept.	
Temp.	
Rof.	45-2
E S	0

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Electrical respirity -- Titanium + 1110n + Ex

Plectrical Registriries, ohm cm z 10⁴

Kirctrical resistivity -- Titanium + Indn + Ta

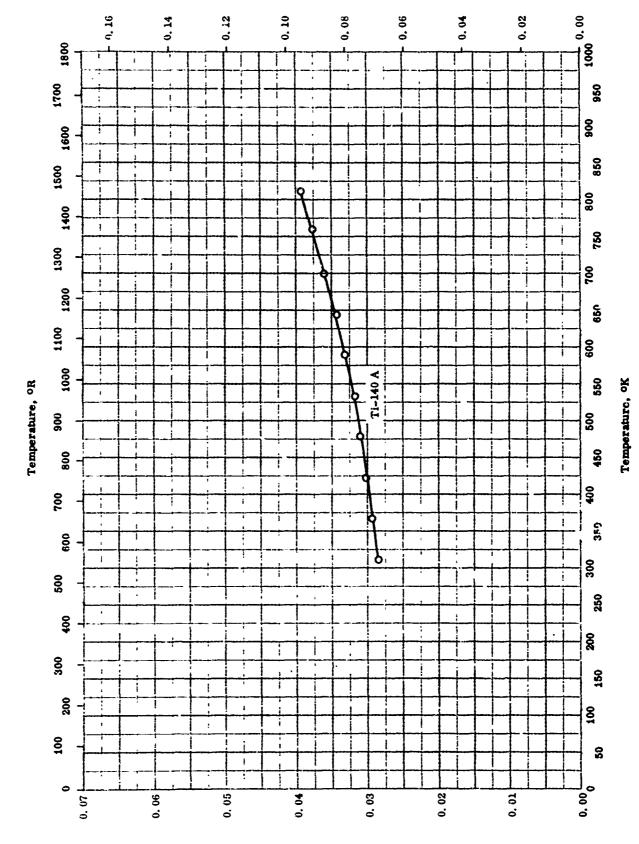
REFERENCE INFORMATION

Remarks	
Mample Specifications	Ti - 140 At nominal: 2, 2 Fe, 2, 1 Cr. unt 2, 0 Mo.
Peror %	4
Temp,	110
Byn Ref.	96-14
1 22	0

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Thermal Conductivity, cal Sec-2 cm-1 K^{-1}

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THERMAL CONDUCTIVITY -- TITANIUM + IRON + ΣX_i

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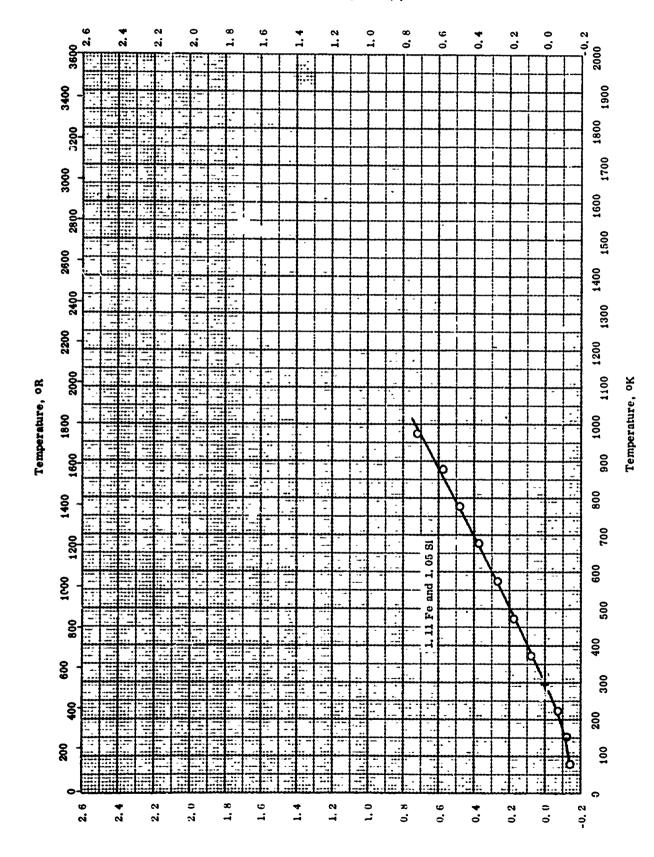
THERMAL CONDUCTIVITY -- TITANIUM + IRON + ΣX_1

REFERENCE INFORMATION

Remarks	In a mild annealed condition.
Sample Specifications	Ti - 140 A; 2.2 Fe, 2.1 Cr, and 2.0 Mo; average composition.
Rept. Error %	ന #
Temp. Range ^O K	311-811
Ref.	58-14
Sym	0

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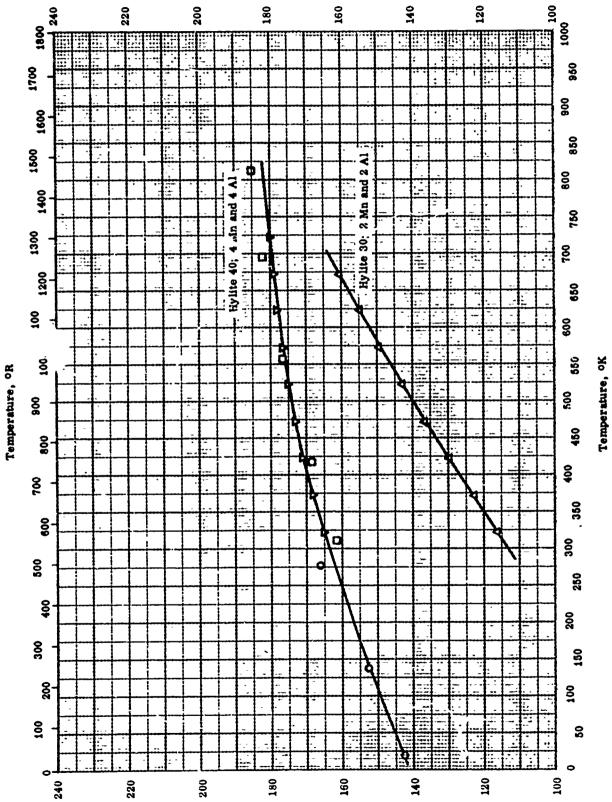
THERMAL LINEAR EXPANSION -- TITANIUM + IRON + ΣX_i

Therinal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- TITANIUM + 1110N + Σx_{j}

REFERENCE INFORMATION

Remarks	
Sample Specifications	1. 11 Fc, 1.05 Si, 0.32 C, 0.17 V, and 0.2 > Nb, Cu each; density 283.5 lb ff ³ .
Rept. Error %	
Temp. Range ok	83-973
Ref.	43-2
Sym	С



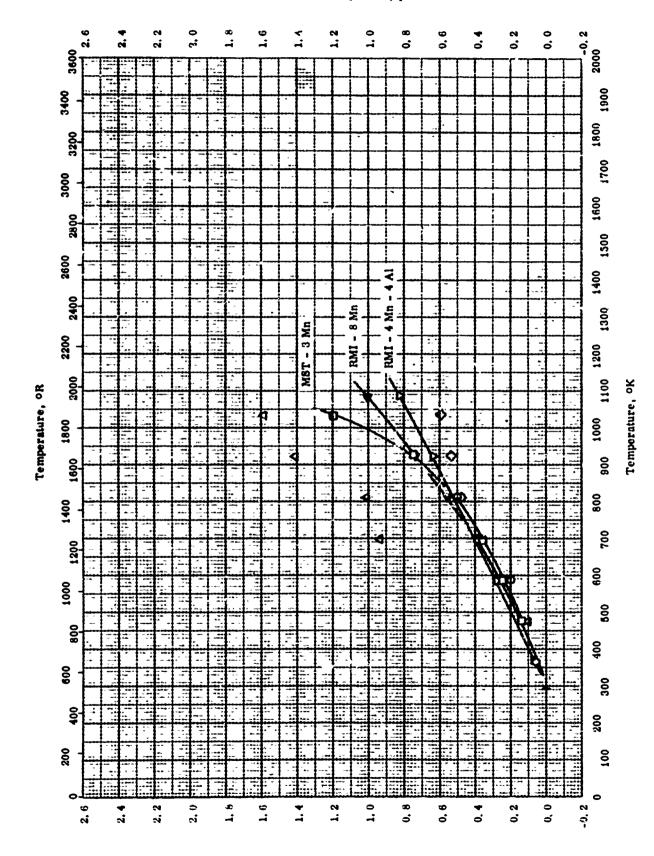
Electrical resistivity -- Titanium + Manganese + Σx_1

Electrical Registivity, ohm cm x 10°

ELECTRICAL RESISTIVITY -- TITANIUM + MANGANESE + ΣX_1

REFERENCE INFORMATION

Remarks								
Sample Specifications	Ti alloy RC-130 B; 4,7 Mn, 3.9!! Al, and 0, 14 C.			Ti alloy C-130 AM (formert RC-130 B); nominal: 4 Mn and 4 Al.	Hylitt 20; 2 Ma, 2 Al, and 0, 015> H2.	Hylite 40; 4 Mn, 4 Al, and 0. 015 > H2.	•	
Rept. Error%	2 +			- 1				
Temp. Range ok	20-300			311-811	323-673	323-723		
Rof.	52-9	al.to	53-10	58-14	61-10	61-10		
Syn	0			0	٥	D		-



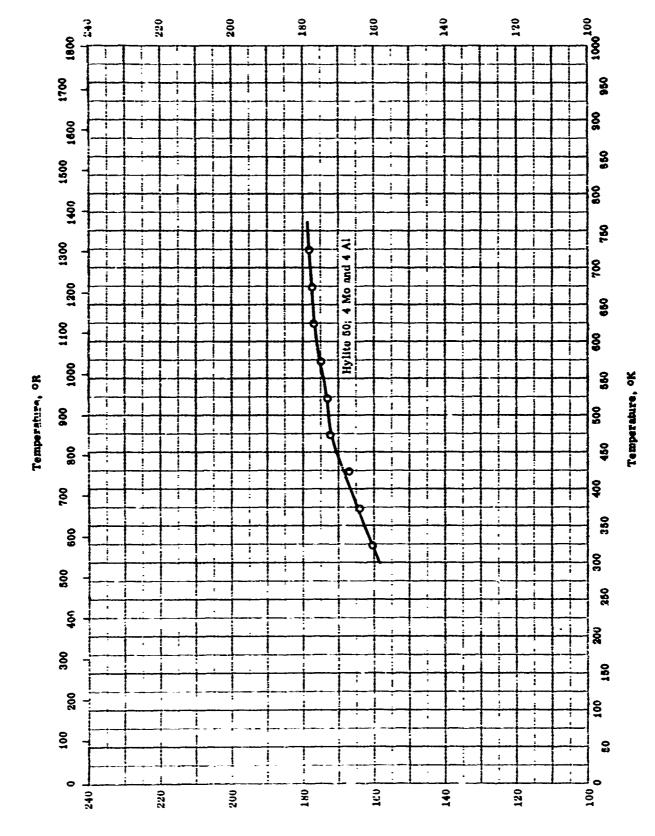
Thermal linear expansion -- Titanium + Manganese + Σx_i

Thermal Linear Expansion, percent

Thermal linear expansion -- titanium $^{+}$ manganese $^{+}$ Σx_{1}^{-}

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electrical resistivity -- titanium + molybdenum + EX_I

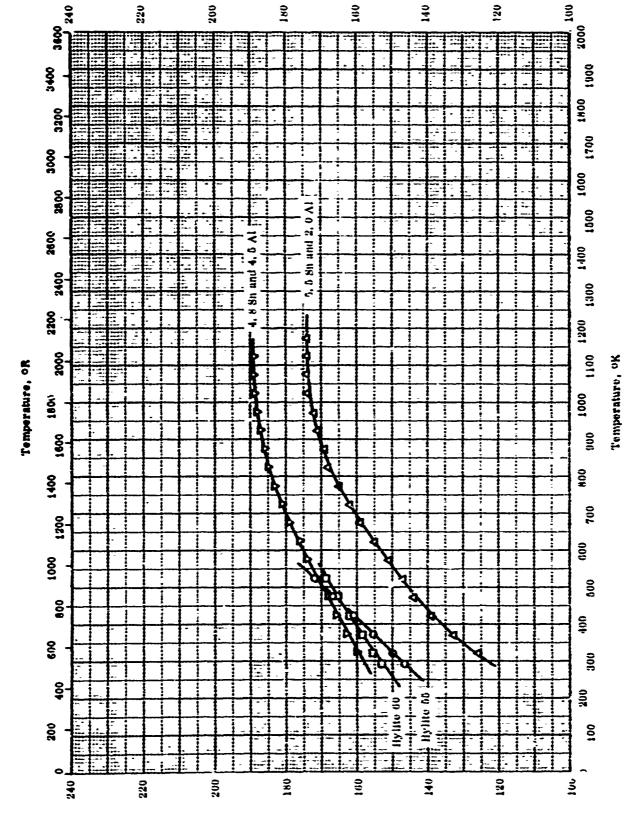
Electrical Resistivity, ohm cm z 10s

ELECTRICAL RESISTIVITY -- TITANIUM + MOLYBDENUM + EX;

REFERENCE INFORMATION

Remarks	
Sample Specifications	Hylite 50; 4 Mo, 4 A
Rept.	
Temp. Range ok	
Ref.	61-10
E S	•

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electrical reserivity -- titanium - tin + dx

Electrical Resistivity, ohm cm / 10

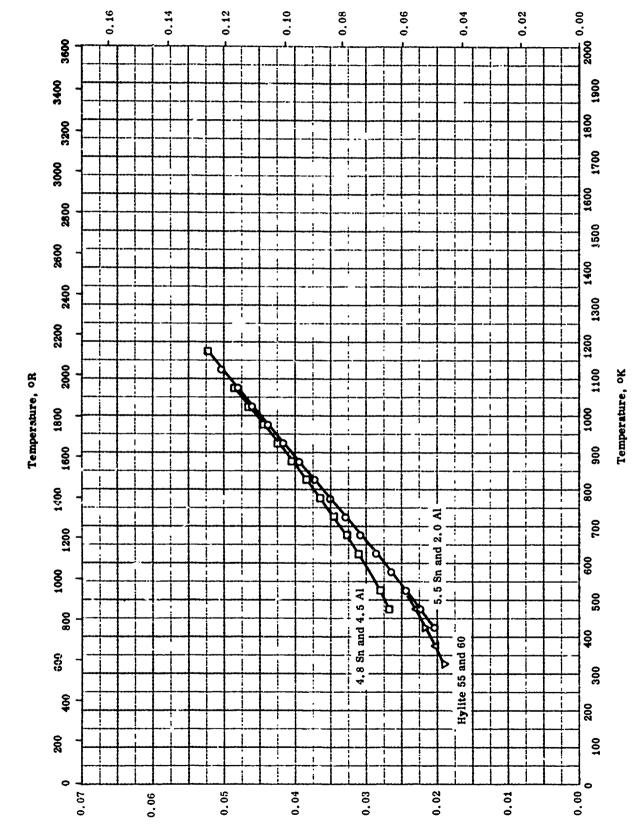
Electrical resistivity -- Titanium + Tin + EX

REFERENCE INFORMATION

Nemarka									
Sample Specifications	Hyllie 56; 68n, 6 Zr, 3 Al, 0, 68t, and 0, 013 > 12,	Hyllic 60; 6 8n, 6 2r, 3 Al, 2 Mo, 0, 5 8l, and 0, 013 > Hr.	5, 5 8n and 2, 0 Al.	4, 8 8n and 4, 7 A1.					
Error %								 	
Temp,		203-023	323-1173	020-1120					
Ref.	9-E9	0-09	01-11	11-10	 	 			
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THERMAL CONDUCTIVITY -- TITANIUM + TIN + ΣX_1

Thermal Conductivity, cal Sec $^{-1}$ cm $^{-1}$ K $^{-1}$

REFERENCE INFORMATION

						 	 	
Remarks								
Sample Specifications	4.8 Sn and 4.5 Al.	5.5 Sn and 2.0 Al.	Hylite 55 from Jessop-Saville L'fD.; 6 Sn. 5 Zr, 3 Al, 0.5 Si, and 0.013 H ₂ .	Hylite 60 from Jessop-Saville LTD.: 6 Sn, 3 Al. 2 Mo, 0.5 Si, and 0.013 H ₂ .				
Rept. Error%						 	 	
Temp. Range ^o K	423-1123	473-1173	323-523	323-523				
Ref.	61-11	61-11	63-9	63-9				
Sym	0	0	٥	D	,,			

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PROPERTIES OF TITANIUM + VANADIUM + ΣX_{i}

REPORTED VALUES

Density g cm⁻³ lb ft⁻³
O 37.4 V and 5.4 Al 4.94 308

TPRC

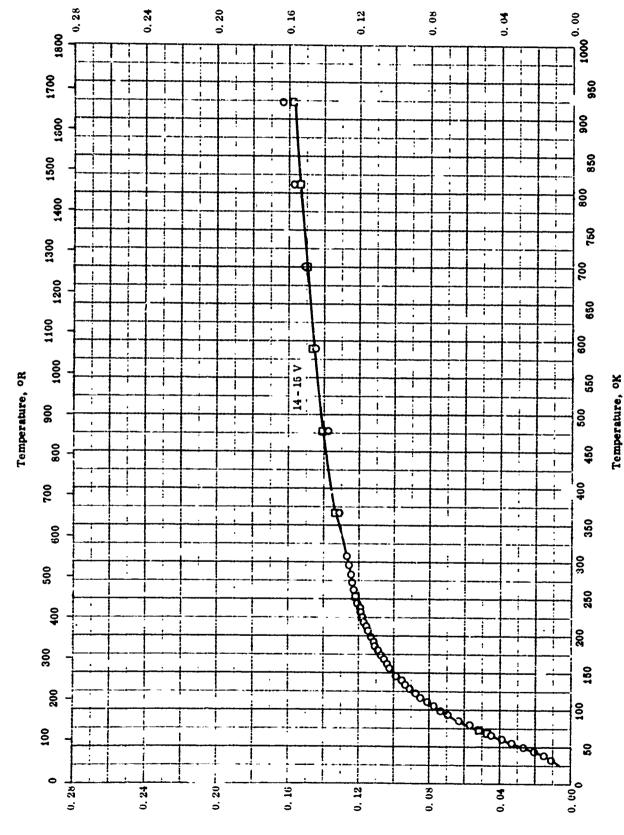
A MONTH PORTY

Properties of titanium + vanadium + Σx_i

REFERENCE INFORMATION

Remarks	Rolled; probably not rolled to max density; density by weight in air and in water.					
Sample Specifications	56.8 li, 37.4 V, 5.4 Al, and 0.67 C.					
Rept. Error%						
Temp. Range ok	298					
Ref.	57-35	 			 	
Sym Boi	0	 	 		 	

TPRC



SPECIFIC HEAT -- TITANIUM + VANADIUM - EX

Specific Heat, cal g-1 K-1

REFERENCE INFORMATION

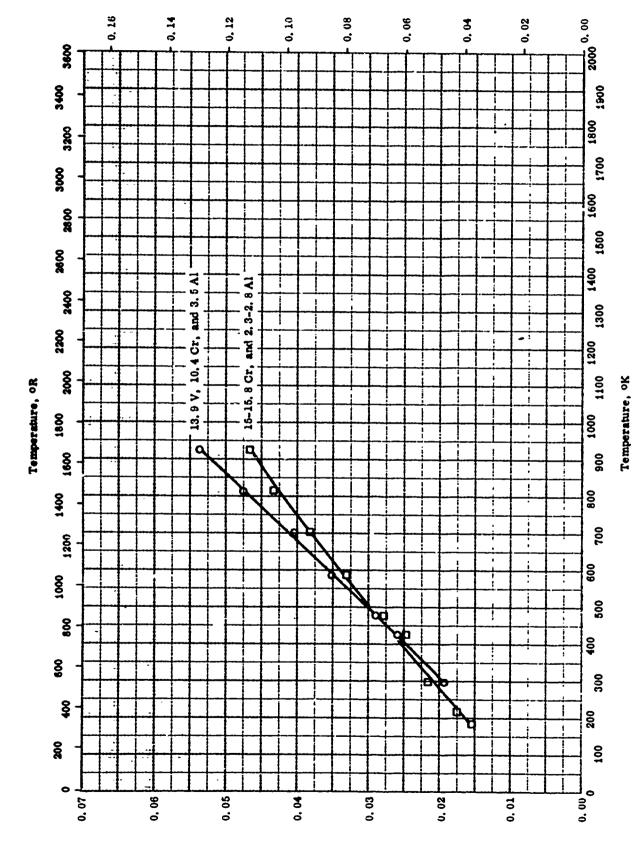
Remarks	Solution treated at 1450 F for 20 min., air cooled, aged at 900 F for 60 hrs and then air cooled.	Solution heat treated at 1410 F for 30 min. and then aged at 930 F for 4 hrs.			
Sample Specifications	13 V-11 Cr-3 Al titanium alloy; 13.9 V, 10.4 Cr, 3.5 Al, 0.25 Fe, 0.04 C, 0.025 N ₂ , and 0.0114 H ₂ .	2. 5 Al-16 V titanium alloy; 14. 95 V, 2. 75 Al, 0. 21 Fe, 0. 03 C, 0. 015 N ₂ , and 6. 0066 H ₂ .			
Rept. Error%	< 2.0	0.7>			
Temp. Range ok	21-922	21-922			
Ref.	61-17	61-17			
E TO SO	0	0			

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THERMAL CONDUCTIVITY -- TITANIUM + VANADIUM + \$\(\Sigma\)

Thermal Conductivity, cal Sec-1 cm-1 K-1

Thermal conductivity -- titanium + vanadium + Σx_i

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REFERENCE INFORMATION

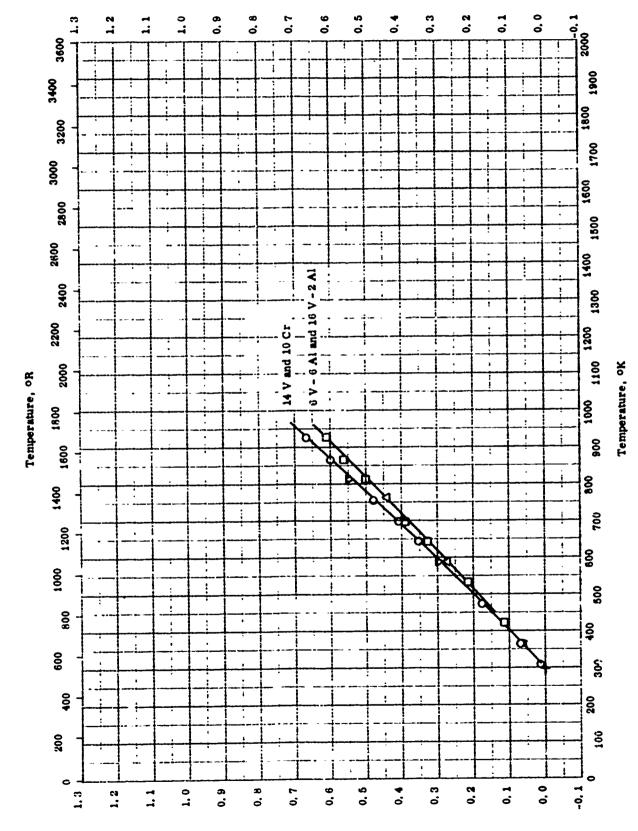
Remarks						
Sample Specifications	B120VCA Crucible heat no. R6759 Sheet no. 9MB3; 13.9 V, 10.4 Cr. 3.5 Al, 0.25 Fo. 0.04 C, 0.025 N2, and 0.0114 H2.	Reactive Metals heat no. 23345 Sheet no. 11453: 15-15.8 V. 2.3-2.8 Al, 0.21 Fe, 0.17 N2, 0.03-0.04 C and 0.0066 H2.				
Rept. Error%						
Temp. Range ok	297-922	183-922				
Ref.	62-11	62-11	 			
Sym	0	0				

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Thermal Linear Expansion, percent

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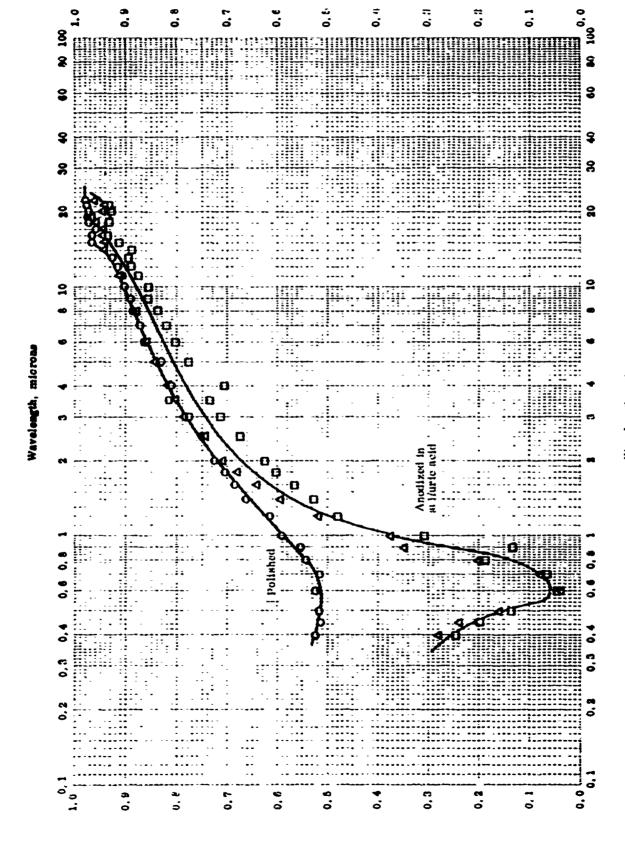
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REFERENCE INFORMATION

Remarks	Cylindrical specimen machined from 0, 125 in. thick sheet parallel to grain direction: solution treated at 1450 F for 20 min, air-cooled, aged at 900 F for 60 hrs, and air-cooled; average value of 2 runs.	Cylindrical specimen machined from 0, 125 in, thick sheet, parallel to grain direction: solution treated at 1410 F for 30 min, water-quenched, aged ut 990 F for 4 hrs, and air-cooled; average value of 3 runs.		
Sample Specifications	B 120 VCA (Crucible heat No. R6759, sheet No. 9MB3); 13, 9 V, Cylindrical specimen machined from 0.125 in. 10.4 Cr. 3.5 Al, 0.25 Fe, 0.04 C, 0.026 N, and 0.0114 H; thick sheet parallel to grain direction; soluti treated at 1450 F for 20 min, air-cooled, age 900 F for 60 hrs, and air-cooled; average value.	Reactive Metals (neat No. 23345, sheet No. 1149-3); 15, 84 V, 2, 31 Al, 0,21 Fe, 0,041 C, 0,018 N, 0,0650 O, and 0,0067 H; dimension 0,1 in. dia by 1,968 in. long.	6 V, 6 Al, and 1 Fe and Cu; density 4, 54 g cm ⁻² ; alpha-beta alloy.	13 V, 11 Cr, and 3 Al; donsity 4, 84 g cm ⁻³ ; beta alloy.
Rept. Error %	8 V	8 V		
Temp. Range ^o K	311-922	311-922	293-811	203-811
Ref.	8 2 - 1 2 9	62-28	63-29	63-29
Sym	0	0	٥	D

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Normal Spectral Reflectance



Normal Spectral Reflectunce

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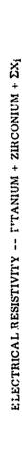
NORMAL SPECTRAL REFLECTANCE -- TITANIUM + VANADIUM + EX₁

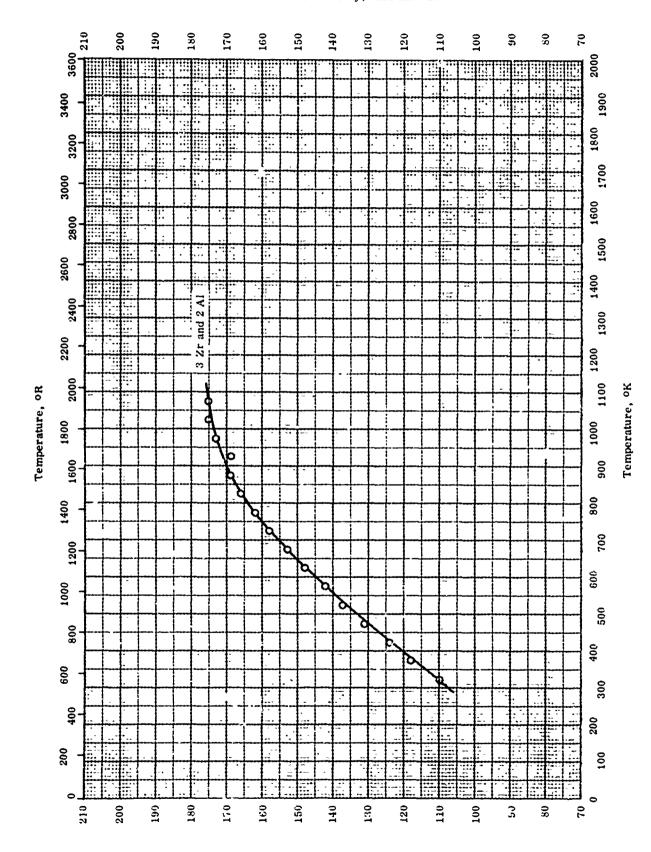
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REFERENCE INFORMATION

į	Temp. "K	Wavelength Junge, 2	Rept.	Sample Specifications	Remarks
	H 0.7	0,4-22,0		79 T1, 13 V, 11 Cr, and 3 Al.	Mechanically and electropolished: 10-6 mm lg vacuum,
	#0#	0.4-82.0		73 Ti, 13 V, 11 Cr, and 3 Ai. [Author's design: 303]	Mechanically and electropoliahed; anodized in sulfuric acid and sealed; 10° b mm lig vacuum; 0, 4 x 10° 4 cm thick conting.
	£	o		73 Tt, 13 V, 11 Cr, und 3 Al, LAubhor, standing, 1 207 J	niverante profitated and pickled; analized in auffuric acid and acuted; 10° 6 mm fig vacuum; 0, 4 × 10° 6 cm thick conting,

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Electrical Resistivity, Sim cm z 106

Remarks	
Sample Specifications	3. 0 2r and 2. 0 Al.
Rept. Error %	
Temp. Range ^O K	323-1073
Ref.	61-11
Sym	0

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THERMAL CONDUCT: 1TY -- TITANIUM + ZIRCONIUM + Σx_i

Temperature, oK

Thermal Conductivity, cal Sec-1cm-1K-1

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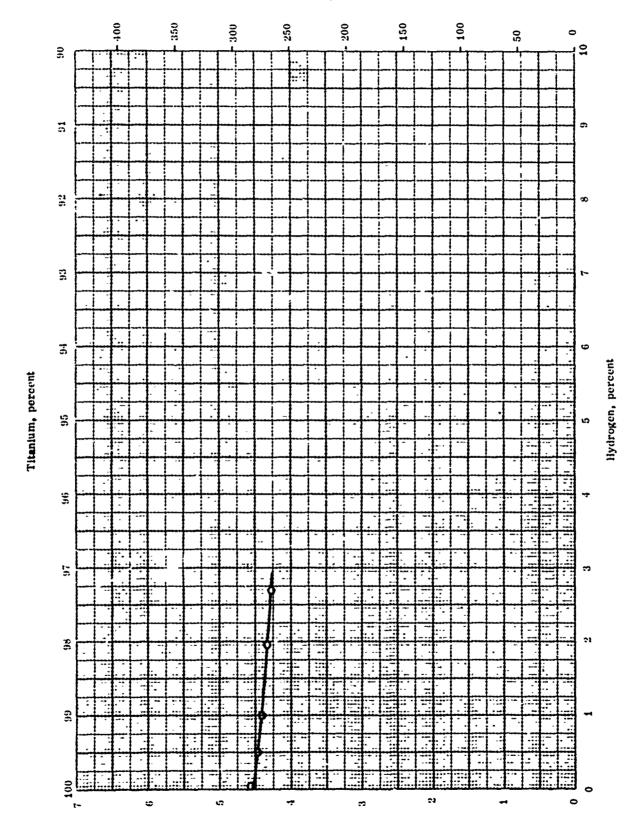
REFERENCE INFORMATION

Remarks		
Sample Specifications	3.0 Zr and 2.0 Al.	
Rept. Error %		
Temp. Range ok	473-1073	
Ref.	61-11	
Sym	0	

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DENSITY -- TITANIUM + EX,

Density, g cm-

Remarks	Ti pre, wed from arc-melted Ti iodide or purchased pure Ti.
Sample Specifications	0-2.7 H; 99, 92 pure Ti with 0, 013 Al, 0.01 Mn, 0, 003 N, 0, 0035 II pre, wed from arc-melled Ti iodide or pur- Fe, 0,0025 Ni, 0,001 each Mo, Sn, Mg, and 0,0072± 0,0007 H₂, chased pure Ti.
Rept. Error%	
Temp. Runge ok	88
Ref.	52-13
Sym	0

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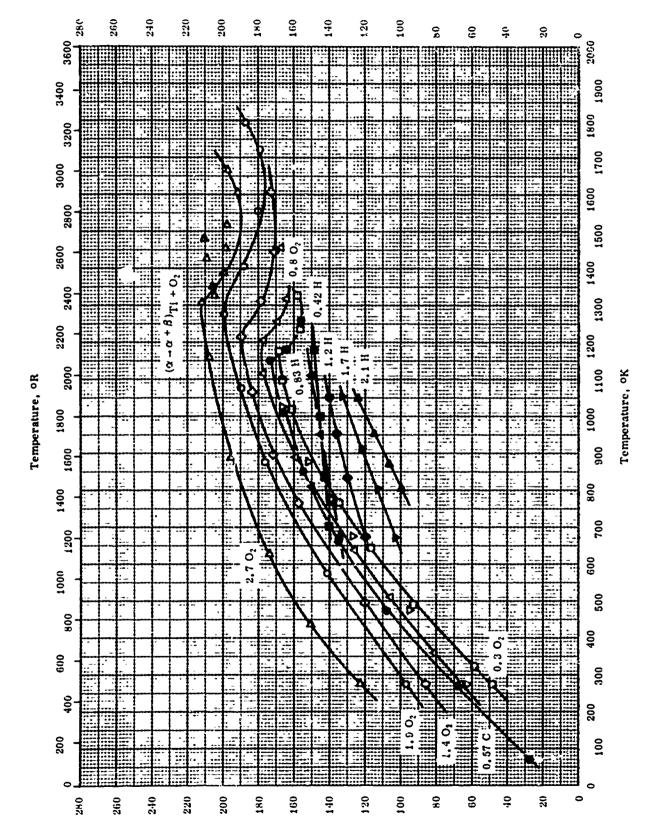
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ELECTRICAL RESISTIVITY -- TITANIUM + \(\Sigma \),

Electrical Resistivity, ohm om x 10^4

ELECTRICAL RESISTIVITY -- TITANIUM + ΣX_{l}

REFERENCE INFORMATION

	e TiO ₂ fusec times.						um with H ₂ a					
Remarks	High purity todide titanium and pure TiO2 fused in He atmos, and remeited several times.	Same as above.	Same as above.		Same as above.	Same as above.	Rod of iodide-titanium in equilibrium with H2 atm.	Same as above.	Same as above.	Same as above.	Same as above.	
Sample Specifications	0.288 O ₂ , 0.001 N ₂ and Mo, Al, Si, Cu, Mg, Mn, Fe, Sn also present as impurities.	0.848 O ₁ , 0.002 N ₂ and Mo, Al, Sl, Cu, Mg, Mn, Fe, Sn also present as impurities.	1.40 O ₂ , 0.002 N ₂ and Mo, Al, Si, Cu, Mg, Mn, Fe, Sn also present as impurities.	1.45 O_2 ; propared from iodide refined (α - phase) titanium and spectroscopically pure TiO ₂ .	1.90 O2, 0.003 N2 and Mo, Al, Si, Cu, Mg, Mn, Fe, Sn also present as impurities.	2.68 O ₂ , 0.006 N ₂ and Mo, Al, Si, Cu, Mg, Mn; Fe, Sn also present as impurities.	0,425.	0.83 H.	1.2 H.	1.7 H.	2.1 H.	Commerical grade; 0.57 C, 0.10 O2, and 0.05 Fe.
Kept. Error%												
Temp. Range ok	273-1323	273-1466	273-1606	273-1623	273-1791	273-1663	673-1177	673-1111	673-1053	673-1053	673-1063	77-1253
Ref.	56-17	56-17	56-17	56-18	56-17	54-17	56-29	62-99	56-29	56-29	56-29	57-26

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SPECIFIC HEAT -- TITANIUM + EX

Temperature, oK

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Specific Heat, cal g"' K"

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0.08

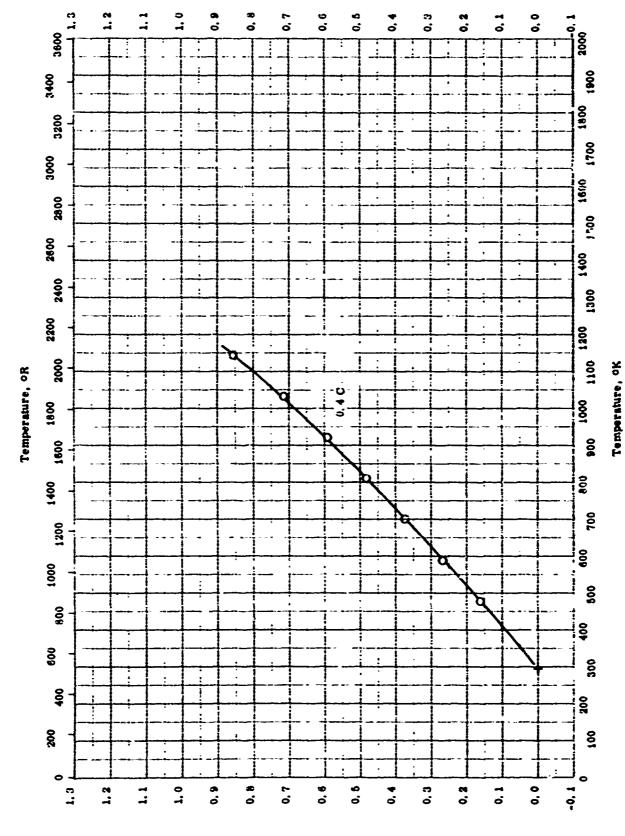
SPECIFIC HEAT -- TITANIUM + Σx_i

REFERENCE INFORMATION

Remarks			
Sample Specifications	Ti Oq. 346; 10, 04 Oz; propared from extremely high purity Ti.	Ti Og. 002; 2. 02 O2; raw material same as above.	
Rept.			
Temp. Range ok)	50-298	
Ref.	57-14	57-14	
Sym	0	В	

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Thermal Linear Expansion, percent

Remarks	
Sample Specifications	0.4 C.
Rept.	5
Tomp, Rept.	207-1144
Her (,	131 - 1
L S	0

PROPERTIES OF TUNGSTEN + NICKEL + ΣX_i

REPORTED VALUES

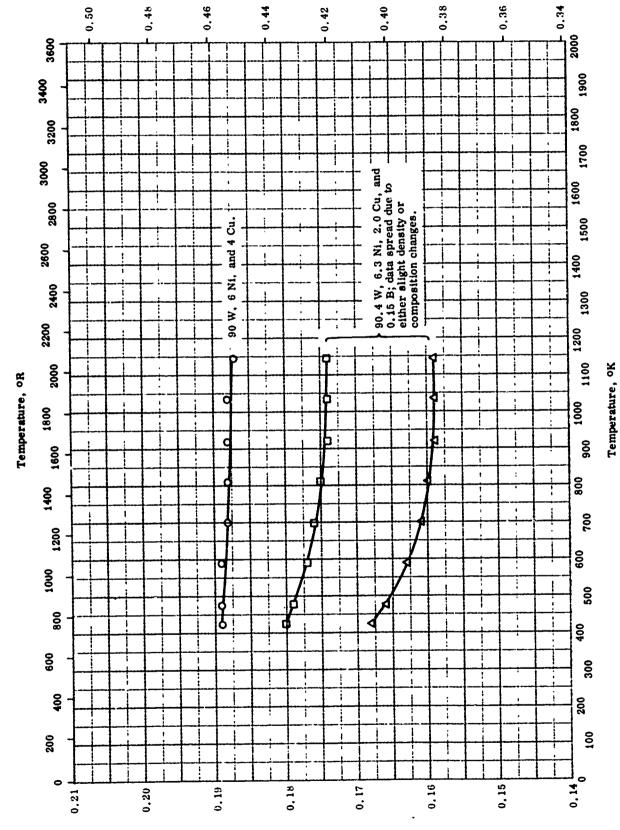
Dens	sity:	g cm ⁻³	lb ft ³
0	7 Ni and 3 Fe	17.15	1071
	4.9 Ni and 2 Fe	17.75	1108
\Diamond	3.5 Ni and 1.5 Fe	18.18	1135
A	7 5 Ni and 2 5 Cu	16 8 ± 0 3	1045 ± 15

Remarks									
Sample Specifications	90 W, 7 Ni, and 3 Fe.	93 W, 4.9 Ni, and 2.1 Fe.	95 W, 5.5 Ni, and 1.5 Fc.	GEC Heavy Alloy (British design.); nominal composition: 90 W, 7.5 Ni, and 2.5 Cu.					
.tept. Error%									
Temp. Range ^O K	298	298	298	298	 ·	 	 ·		
Ref.	54-25	54-25	54-25	54-26					
Sym	0	0	\Q	۵	 	 	 		

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Thermal Conductivity, cal cm $^{-1}$ Sec $^{-1}$ K $^{-1}$

Remarks			Same as the above sample except either a slight	density or composition changes.										
Sample Specifications	90 W, 6 Ni, and 4 Cu.	90.4 W, 6,3 Ni, 2.0 Cu, and 0.15 B.	90.4 W, 6.3 Mi, 2.0 Cu, and 0.15 B.											
Rept. Error %					-					 		 		
Temp. Range ^O K	422-1144	422-1144	422-1144				 							
Ref.	61-7	61-7	61-7			_ - _		_			_	 	- 	
Eoi Foi	0	۵	٥									 		

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THERMAL LINEAR EXPANSION -- TUNGSTEN + NICKEL + Σx_1

Temperature, oK

TPRC

Thermal Linear Expansion, percent

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Thermal linear expansion -- Tungsten + Nickel, + $\Sigma x_1^{}$

REFERENCE INFORMATION

Remarks	Made by British General Electric Co., Ltd.	Measured in argon.	Measured in argon.	Measured in argon.	Measured in argon.
Sample Specifications	.eavy Alloy (British design.); nominal: 90 W, 7.5 Ni, and 2.5 Made by British General Electric Co., Ltd. Cu; density 1030 - 1060 lb ft ⁻³ .	Mallory 1000; 90 W, 6 N4, and 4 Cu.	90.01 W, 5.81 Ni, 3.76 Cu, 0.23 B (92 B ¹⁰ enrichment); density Measured in argon. 16.58 g cm ⁻³ . [Author's design.: Vendor A].	90, 83 W, 6, 32 Mi, 1, 98 Cu, and 0, 15 B; density 16,38 g cm.3. [Author's design.: Vendor B].	90 W, 5 - 6.0 Ni, 3 - 4.0 Cu, 0.20 - 0.25 B (92 min Bi ⁹), 0.1 max Co, 0.01 max Cd, and 0.05 max total rare earth; denvity 16.7 ± 0.2 g cm ⁻³ . [Author's design.: B50YA12B].
Error%					
Range ok	293-095	294-1144	294-1094	294-1086	294-1142
	54-26	61-7	61-7	61-7	7-19
Ž.	0	0	٥	•	⋄

PROPERTIES OF TUNGSTEN $+\Sigma X_{i}$

REPORTED VALUES

 Density:
 g cm⁻³
 lb ft⁻³

 Δ 99 W
 11.00
 686.7

 ♦ 99 W
 16.4*
 1024*

Most probable value for alloys of this composition.

Remarks	Pressed from - 270 mesh powder at 81500 pst to 0.569 of theoretical density.	Pressed from -270 mesh powder at 81,500 psi, then fired 2-4 min at 2200 - 2300 C.					
Sample Specifications	99 pare.	99 pure.					
Rept.	-		<u> </u>		 	-	
Temp. Range ok	862	298					
Ref.	87-09	50-13					
Sym	٥	\lambda					

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PROPERTIES OF URANIUM + MOLYBDENUM + ZX

REPORTED VALUES

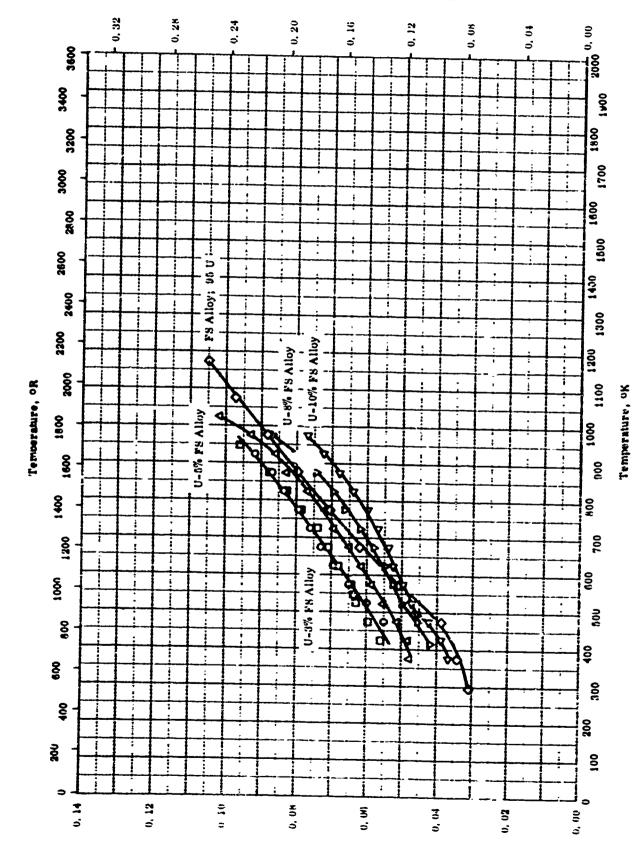
Melting Point: K R
O 2.46 Mo and 1.96 Ru 1276 2296

Remarks	
Sample Specifications	Figs in and 0,03 others.
Rept.	
Temp.	
Ref.	3t0c
Ę	0

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THERMAL CONDUCTIVITY -- URANIUM + MOLYBDENUM + XX

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Thermal Conductivity, cal Sec ^1 cm ^1 K^-:

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Samo as above except measured by using Armo induction molted in encum and enet; measured Remarks uning Inconel an numberd. fron as standard. Cur. CHHI. Car. U - 3% FS Alloy; 06, 974 U, 1, 5 Mo, 1, 2 Ru, 0, 16 Rh, 0, 12 Pd, 0, 04 Zr, and 0, 006 Nb, F8 Alley: 10 U, 2, 40 Me, 1, 90 Mu, 0, 28 Mb, 0, 19 Pr, 0, 10 Zi, U - 0% F8 Alloy; On. 676 U, 2, 06 Mo, 1, 86 Ru, 0, 196 Ri, U - #% FM Alley; D2, 342 U, 3, 73 Mo, 3, 12 Ru, 0, 415 Rb, U - 10% FRANOY; 90, 334 U, 4, 63 Mo, 4, 99 Ru, 9, 54 Rh, Sumple Specifications 0, 240 Pd, 0, 006 Zr, and 0, 017 Nh. and 0, 01 Nbt minited companition. 0, 368 Pd, 6, 118 Zr, and 0, 02 Nb, 0, 136 Pd, 0, 063 Zr, and 0, 01 Nb. Same na above, 42:3-048 203-1173 47:3-023 373-1023 410-079 17:1-07:3 01-4 01-19 5 1-00 8-10 = 7= 0 7 0 4 Þ

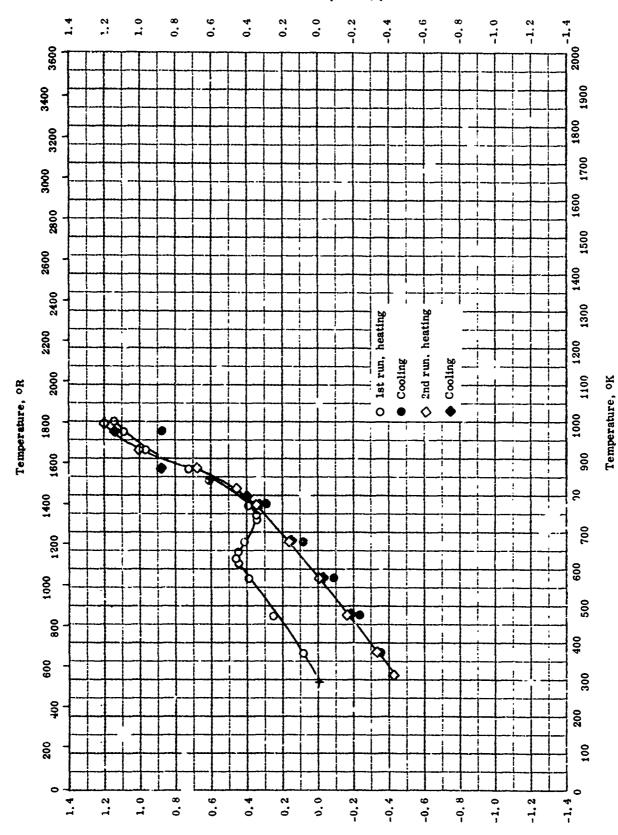
THERMAL CONDUCTIVITY -- URANIUM : MOLYBDENUM : EX

REFERENCE INFORMATION

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Thermal Linear Expansion, percent

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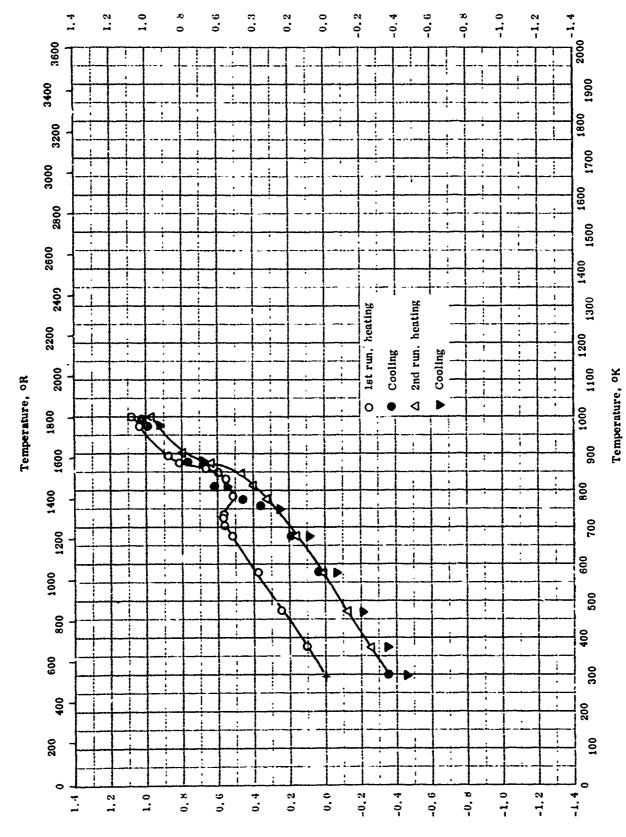
THERMAL LINEAR EXPANSION -- URANIUM + MOLYBDENUM + ΣX_1 (2, 4 Mo)

REFERENCE INFORMATION

Remarks	Prepared from as cast material; heating rate between 1 to 2 C min ⁻¹ ; 1st run.	Cooling data of above specimen.	2nd run; heating.	Cooling data of above specimen.	
Sample Specifications	2.4 Mo, 2 Ru, 0.3 Rh, 0.2 Fd, 0.05 Zr, and 0.01 Nb; density 17.99 g cm ⁻³ .	Same as above.	Same as above.	Same as above.	
Rept. Error%					
Temp. Range ^O K	293-1001	3.3-1001	866-867	373-998	
Ref.	58-30	58-30	58-30	58-30	
Sym	0	•	◊	•	

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THERMAL LINEAR EXPANSION -- URANIUM + MOLYBDENUM + Σx_{\parallel}



Thermal Linear Expansion, percent

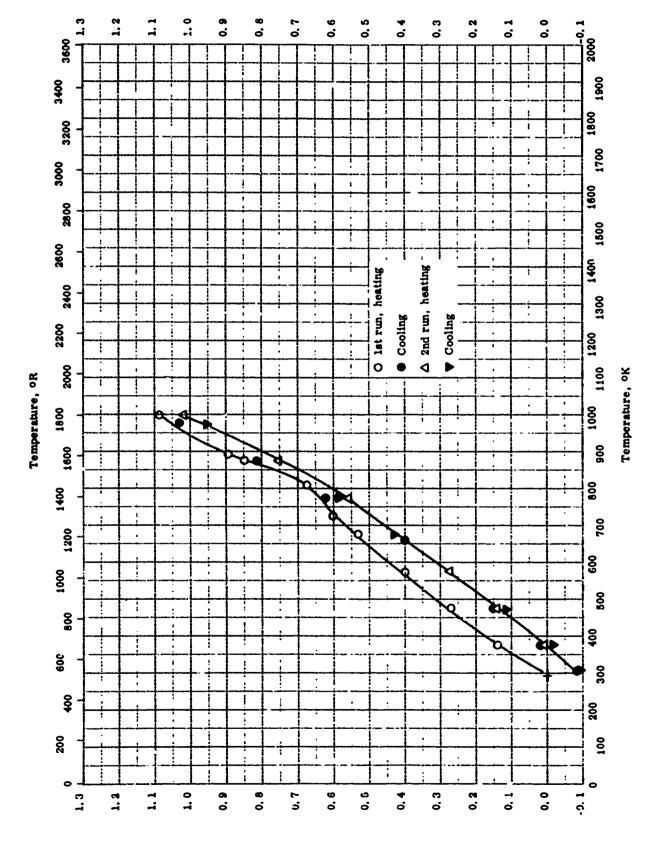
Remarks	Prepared from as cast material; heating rate between 1 to 2 C min ⁻¹ ; first run.	Cooling data of above specimen.	Second run; heating.	Cooling data of above specimen.	
Sample Specifications	3.8 Mo, 3 Ru, 0.4 Rh, 0.3 Pd, 0.07 Zr, and 0.02 ND; density 17.62 g cm ⁻³ .	Same as above.	Same as ulxive.	Same as above.	
Rept. Error%					
Temp, Range ^O K	293-998	303-998	293-398	303-998	
Ref.	58-36	58-30	58-30	58-30	
Sym log	0	•	۵	Þ	

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Thermal linear expansion -- uranium + molybdenum + $\mathbb{E}x_1$ (4.8 Mo)

Thermal Linear Expansion, percent

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THERMAL LINEAR EXPANSION -- URANIUM + MOLYBDENUM + Σx_1 (4. 8 Mg)

REFERENCE INFORNATION

Remarks	Propared from as east material; heating rate between 1 to 2 C min ⁻¹ ; first run.	Cooling data of above specimen.	Second run; heating.	Cooling data of above specimen.	
Sample Specifications	4, 8 Mo, 4 Ru, 0, 6 Rh, 0, 4 Pd, 0, 1 Zr, and 0, 02 Nb; donsity 17, 36 g cm ⁻³ .	Вате ан вроуе.	Same as above.	Same as above.	
Rept. Error %					
Temp. Brage ok	203-008	303-008	293-998	303-808	
Ref.	58-30	58-30	68-30	68-30	
E SE	0	•	٥	•	

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properties of uranium + plutonium - Σx_i

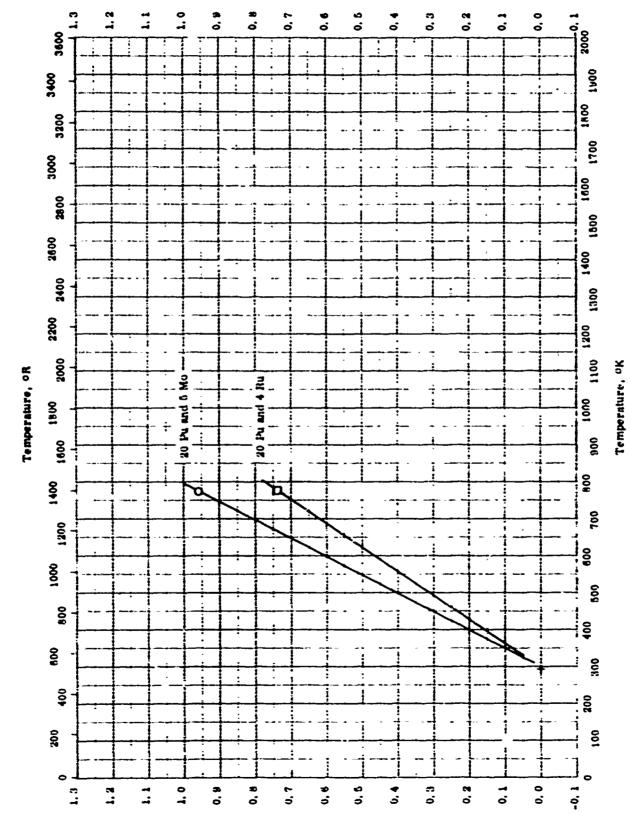
REPORTED VALUES

Melting Point: K R
O 20 Pu and 0.25 Mo 1203 2166

Remarks	Containing 10% flasium.			
Sample Specifications	79.6 U, 20 Pu, 0.35 Mo, 0.20 Ru, 0.03 Rh, und 0.02 others.			
Rept.				
Temp. Rung ok	1203			
Rof.	67-			
Log Log	0			

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Thermal Linear Expansion, percent

THERMAL LINEAR EXPANSION -- URANIUM + PLUTONIUM + Σx_1

Nemarks	Ar cant,	бате ан авоуе,					
Sample Specifications	20 Pu and 6 Mo.	20 Pu, 4, 3 Ru, 2, 8 Mo, 2, 5 Pd, 0, 7 Rh, and 0, 6 Zr,					
Rept.				 	 		
Temp.		203-773					
lle (,	50-44	56-44		 - -	 		
Lion Age	0	0	·	 	 		

1531

THE PROPERTY OF THE PROPERTY O

properties of uranium - thorium - Σx_i

REPORTED VALUES

Melt	ting Point:	К	R
0	4,25 Th and 3,56 Zr	1428	2570
2	33 3 Th and 53 3 7r	1477	2639

PROPERTIES OF URANIUM - THORIUM - EN

Remarka	M. P. by observing first liquid drop,	Rame as above.		-			
Rept. Sample Specifications	90 U, 4,26 Th, and 3,86 Zr,	30.3 U, 33.3 Th, and 33.3 Zr.					
Rept.					 	 	
Temp.		1428-1533					
₩.ί.	1-1-00	20-14				 	
	0	0					

PROPERTIES OF URANIUM + ZIRCONIUM + ΣX_i

REPORTED VALUES

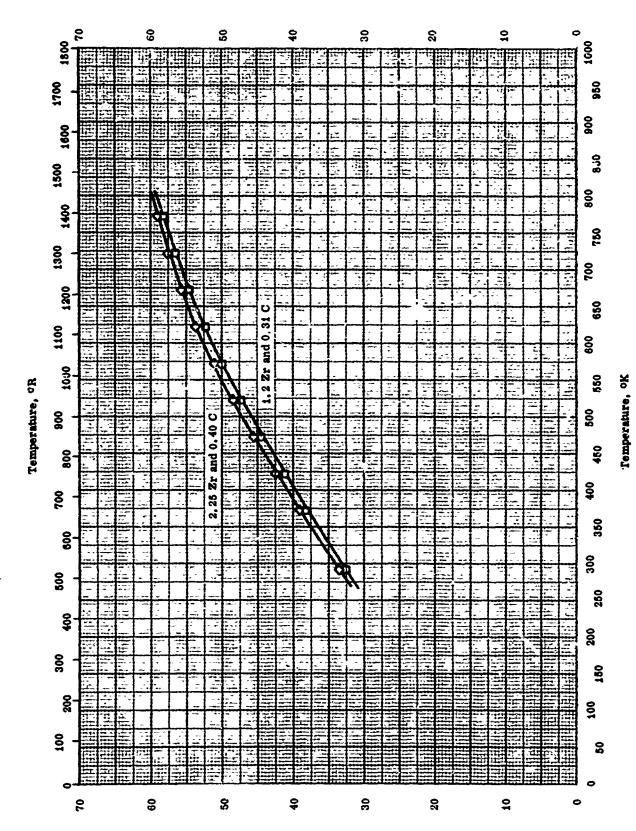
Melting Point: K R
O 33.3 Zr and 33.3 Th 1477 2659

Properties of uranium + zirconium + Σx_i

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E C C E	
RENCE	
E C C E	

Remarks	M.P. by observing the first liquid drop.
Sample Specifications	33.3 U, 33.3 Zr, and 33.3 Th.
Rept. Error%	
Temp. Ranga ³ K	
Ref.	50-14
E O	0

Electrical Resistivity, ohm cm x 10^6

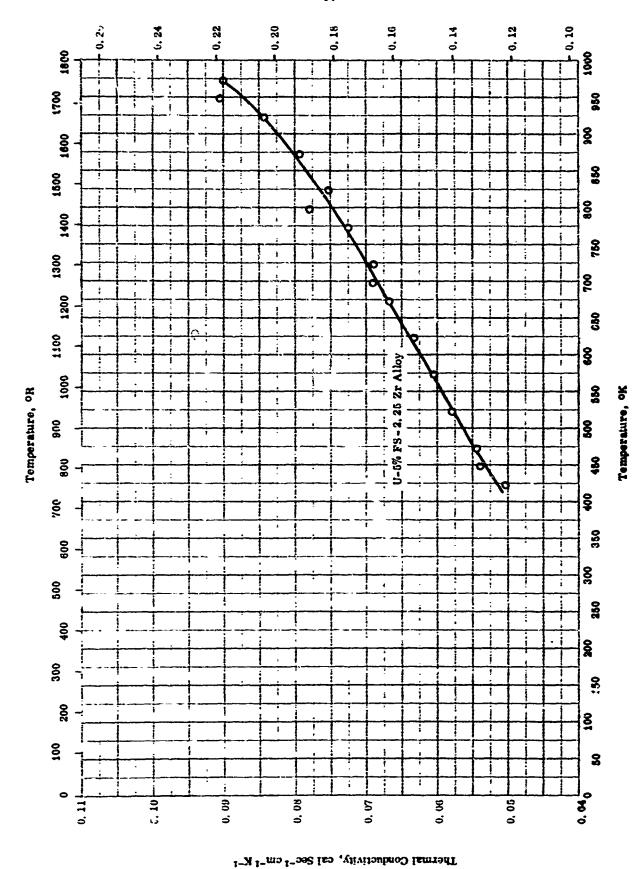


ELECTRICAL RESISTIVITY -- URANIUM +ZIRCONIUM + ZX

Electrical Resistivity, ohm cm x 10°

ELECTRICAL RESISTIVITY -- URANIUM +ZIRCONIUM + ΣX_1

			=	 	 	 	
Remarks	Heated 1 hr at 725 C in vacuum and with; quenched,	Heated 1 hr at 800 C in vacuum, 1 hr at 560 C, and air cooled,					
Sample Specifications	1.22 Zr and 0.31 C.	2,25 Zr and 0,40 C.					
Rept. Error%							
Temp.	292-1073	293-1073					
Ref.	55-21	55-21			 	 	
Sym Bom	0	\lambda					



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THERMAL CONDUCTIVITY -- URANIUM + ZIRCONIUM + ZX

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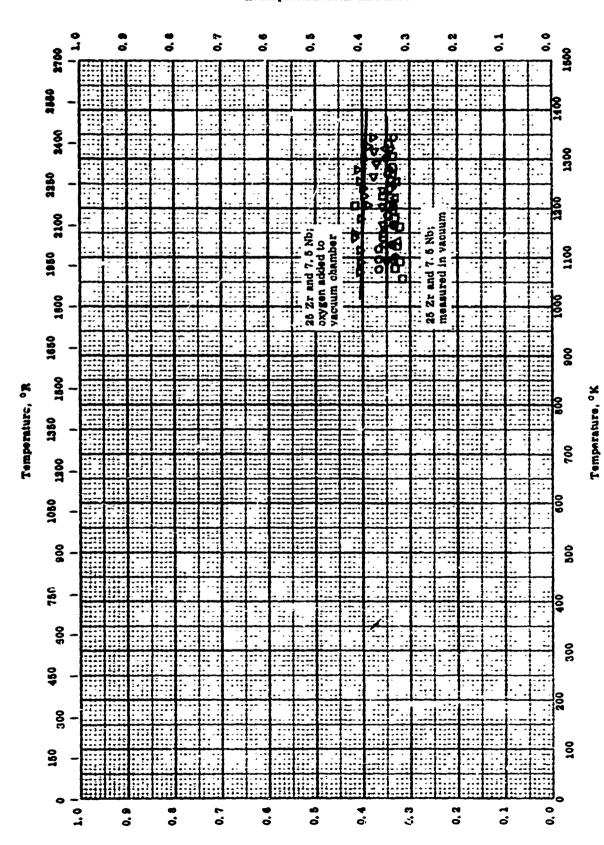
THERMAL CONDUCTIVITY -- URANIUM + ZIRCONIUM + Σx_l

Romarks	Cust.
Sample Specifications	U - 5% FS - 2.25 Zr alloy: 2.54 Zr. 1.85 Mo. 1.76 Ru, 0.189 Rh, 0.135 Pd, and 0.01 Rb.
Rept.	
Temp. Range Ok	4.32-9?.3
Ref.	5 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2
mog Skill	0

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HEMISPHERICAL TOTAL EMITTANCE -- URANIUM + ZIRCONIUM + EX,

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Hemispherical Total Emittance

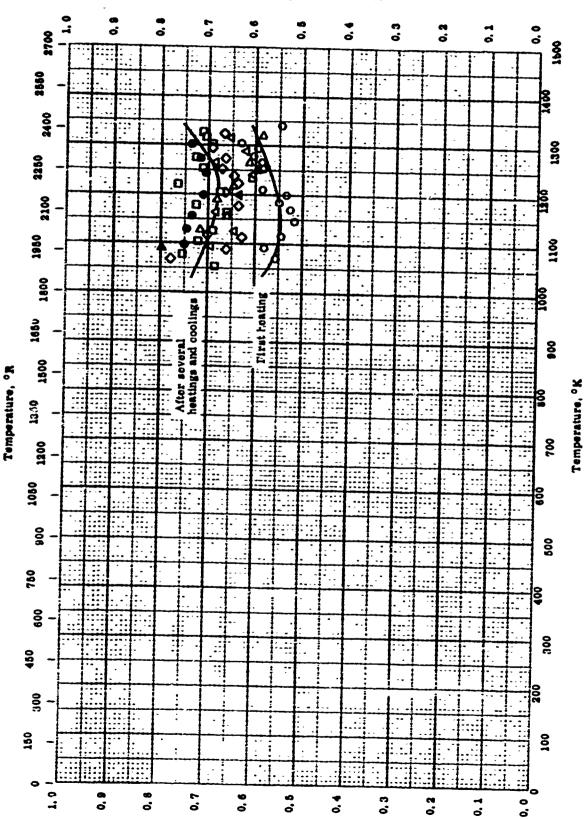
TPRC

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THE TAXABLE PARTY OF THE PROPERTY Hemispherical total emittance -- uranium + zirconium + Σx_{i}

Remarks	Rolled at 815 C then annealed, quenched, and cold rolled; measured in vacuum; first heating.	The above specimen; first cooling.	The above apecimen; secured heating.	The above specimen; second cooling.	The above specimen; 6 charges of crygen added to	vacuum chamber; (single charge of oxygen equal to 2, 5 cm ³ at 1 atm, 1173 K); chamber at pressure of 2 x 10 ⁻⁶ mm Hg, prior to addition of oxygen charge; first heating.	The above apeal men; first couling.	
Sample Specifications	75 (U + 10 Nb) and 25 Zircaloy 2; nominal: 67.5 U, 24.55 Zr, 7.5 Nb, 0.375 Sn, 0.0375 Fe, 0.025 Cr, and 0.0125 Ni.	Same : a above.	Same as above.	Same as above.	Same as above.		Same as above.	
Rept. Error %								
Temp. Range ok	1074-1341	1091-1321	1056-1330	1100-1301	1070-1344		1091-1315	
Ref.	117-49	57-49	67-49	57-40	67-49	_	67-49	
Liog South	0	٥	0	•	D		♥	





normal spectral emittance -- uranium + zinconium + ±x₁

Normal Specinal Emittance

Normal spectral emittance -- uranium + zirconium + Σx_1

								. <u></u>
Remarks	Rolled at 1088K then annealed, quenched, and cold rolled; measured in vacuum; first	The above spiedmen: first gooding.	The above specimen: second heating.	The above speciment second cooling.	The above specimen: 6 charges (2,6 cm ³ at at atmospheric pressure por charge) of oxygen added to encum chamber (chambor at 2 × 10 ⁻⁶ mm lig and specimen at approximately 117:1 K).	The above specimen: first gooling.		
Sample Specifications	76 (U + 10 Nb) and 25 Zircaloy 2; nominal: 67, 5 U, 24, 55 Rolled at 1088K then annealed, quenched, and Zr. 7.5 Nb, 0,375 Sn, 0,0375 Fe, 0,025 Cr, and 0,0125 cold rolled; measured in vacuum; first	Same an above.	Same as above.	Rame as abova.	Same us above,	Same as above.		
Rept.								
Temp. oK Range, oK	1071-1340	1001-1324	1000-1028	1008-1001	1060-1:12:1	1010-1010	. — ——	
Wavelength y	0.66	0, 05	0, 00	0.00	0, 00	e •		
Rof.	67-40	67-40	87-48	04-20	67-49	01		
E-0	0	Δ	0	•	\$	4		

PROPERTIES OF URANIUM $+\Sigma X_i$

REPORTED VALUES

Heat of Fusion:

cal g⁻¹

Btu lb⁻¹

O 93 U²³⁵

²⁰1406 K

³⁶2531 R

Heat of Vaporization:

cal g⁻¹

Btu lb-1

□ 93 U²³⁵

453.7±0.4,406K

816.6 ± 0.8 2531 R

Heat of Sublimation:

cal g⁻¹

Btu lb⁻¹

Δ 93 U²³⁵

495.7 ±0.4₀R

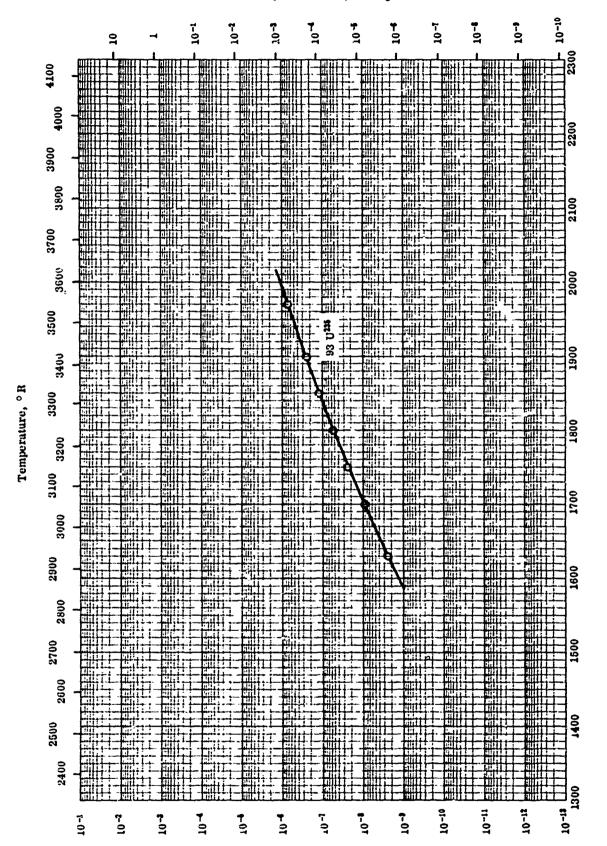
892.3 ± 0.8 0R

PROPERTIES OF URANIUM $+\Sigma X_j$

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Remarks	Δhf from vapor pressure data.			Ahyfrom vapor pressure data.			Δh _g from vapor pressure data.									
Sample Specifications	93 pure U25.			93 pure U ²⁵ .			93 pure U25.									
Rept. Error %								`						-,-,-		
Temp. Range ^O K	1406			1406			•			 					 	
Ref.	54-7	also	54-8	54-7	also	54-8	54-7	also	54-8						 	
No.	0			0			٥			\				 		

VAPOR PRESSURE -- URANIUM + EXI



Vapor Pressure, atm.

VAPOR PRESSURE -- URANIUM + EX;

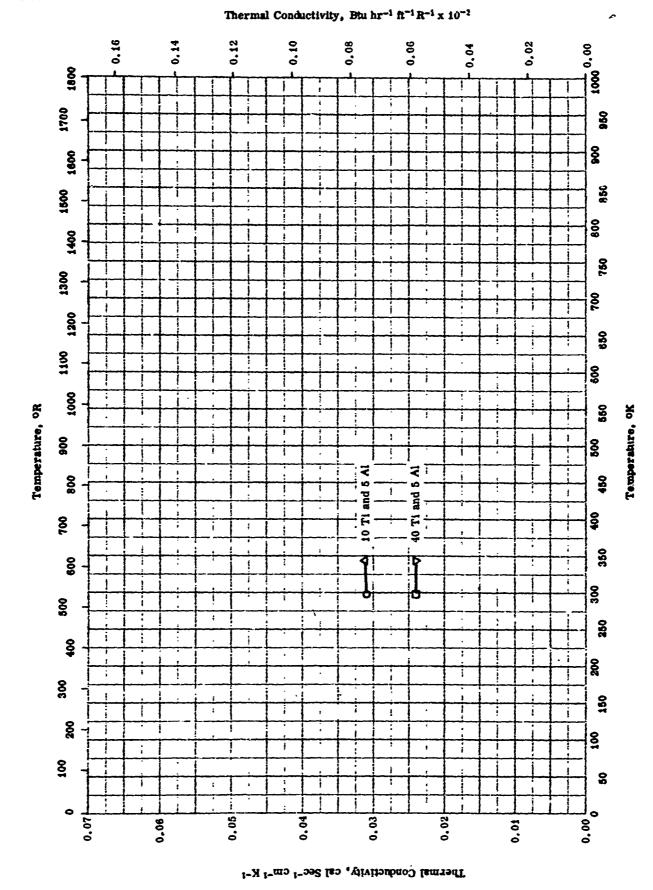
Remarks	Received as wire; cleaned anodically in 46% H ₂ SO ₄ + 6% glycerin; results corrected for residual O ₂ and Ta impurities (capsule).
Sample Specifications	93 U ²⁵⁵ .
Rept. Error %	
	0240
Temp.	1630-1970
Ref.	54-8 also 54-7
Sym	0

Thermal conductivity -- vanadium + silicon + Σx_1

Thermal Conductivity, cal Sec-1 cm-1 K-1

THERMAL CONDUCTIVITY -- VANADIUM + SILICON + ΣX_j

Remarks		Alloy formed by arc melting rive materials and remelted several times without opening furnace to incure homogeneity; forgod and machined.
Sample Specifications	3 Si and 2, 5 Zr.	3.81 and 2.6 Zr; calciumanted 99.64 V and 99.881 and Zr; lomogeneous.
Rept. Error%		ෆ #
Tomp. Range fix	298	6 4 6
Ref.	57-5	ය ද
150 150 150 150 150 150 150 150 150 150	0	0



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THERMAL CONDUCTIVITY -- VANADIUM + TITANIUM + EX

Remarks			Alloy formed by are melting raw materials and romoited several times without opening furnace to insure homogeneity; forged and machined.	Samo as abovo.	
Sample Specifications	10 Ti and 5 Al.	40 Ti and 5 Al.	10 Ti and 6 Al; calcium-reduced 99, 6+V and 99+ Ti and Al; homogencous.	40 Ti and 6 Ai; same as above.	
Rept. Error%			en 41	⇔	
Temp. Range ok		298	343	343	
Ref.	67-5	57-5	55-5	2-29	
Sym	0	0	٥	D	

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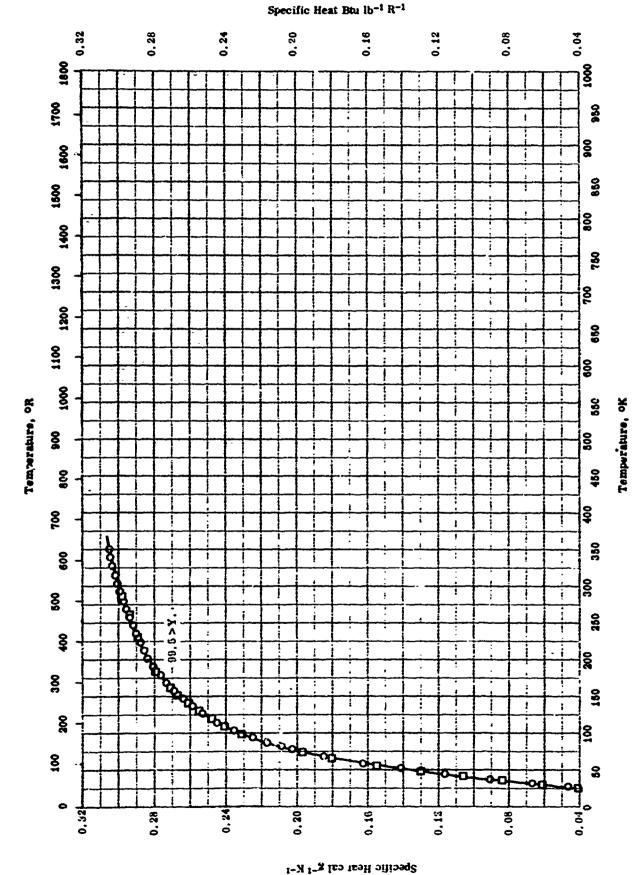
PROPERTIES OF YTTRIUM + TERBIUM + ΣX_i

REPORTED VALUES

Density g cm⁻³ lb ft⁻³
O 0.5 Tb and 0.2 Dy 4.55 284

Properties of yttrium + terbium + Σx_1

Remarks	Density from weight in air and in CCl4.
Sample Specifications	Mg, and Si.
Rept.	
Temp. Range oK	
Ref.	55-22
Sym	0



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CONTRACTOR OF THE PROPERTY OF

Specific heat -- Y it mum + Ex,

1

Remarks	Run 1.	Run 2.	
Sample Specifications	hefore tests < 0.5 total of Ca. Cr. Dy, Gd, Mg, 0.025 Nz, 0.016 C; after tests 0.07 YOF, 0.44 Ta.	Same nu abovo.	
Rept.			
Tump.		12-332	
Ref.	11-0))	00-14	
Pych Boll	0	S	

0.13

0.12

0.11

0.36

0.34

0.32

0.30

0.38

0.40

- 0.24

THERMAL DR FUSIVITY -- YTTRIUM + EXI

0.23

0.4

0.48

0.46

1900 3400 3000 1500 2600 2400 2200 1100 Temperature, oK Temperature, oR 900 1600 800 400 700 1200 1000 1000 200 800 400 88 300 \$ 8 8

Thermal diffuelvity, cm2 Sec-1

0.09

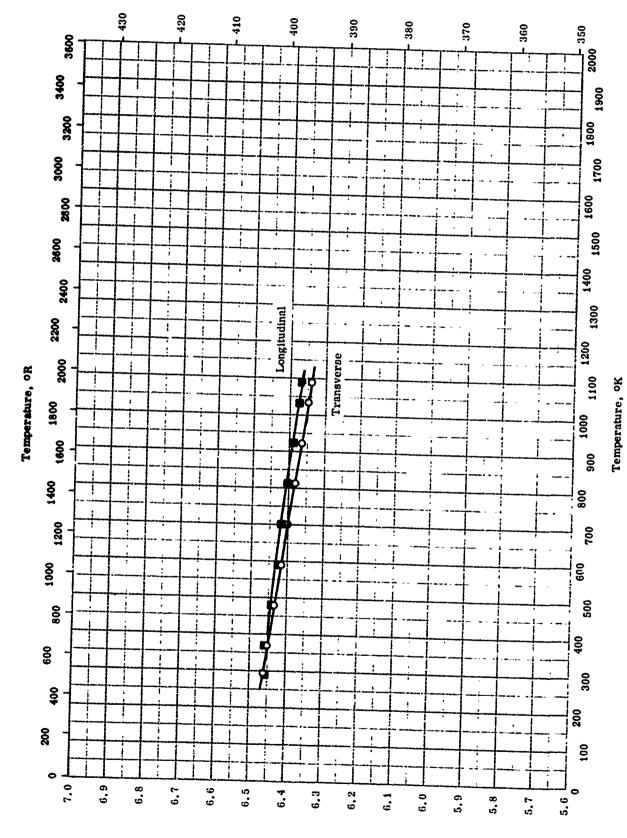
0.08

0.07

0.10

THERMAL DIFFUSIVITY -- YTTRIUM + ΣX_1

Remarks	
Sample Specifications	99.34 Y, 0.5>O, 0.1 < Ca, 0.05 Mg, and traces of Al, Cu, B, Fe, Mn, Si, and Zr.
Rept. Error%	
Temp. Range oK	
Ref.	60-2
E 3	0

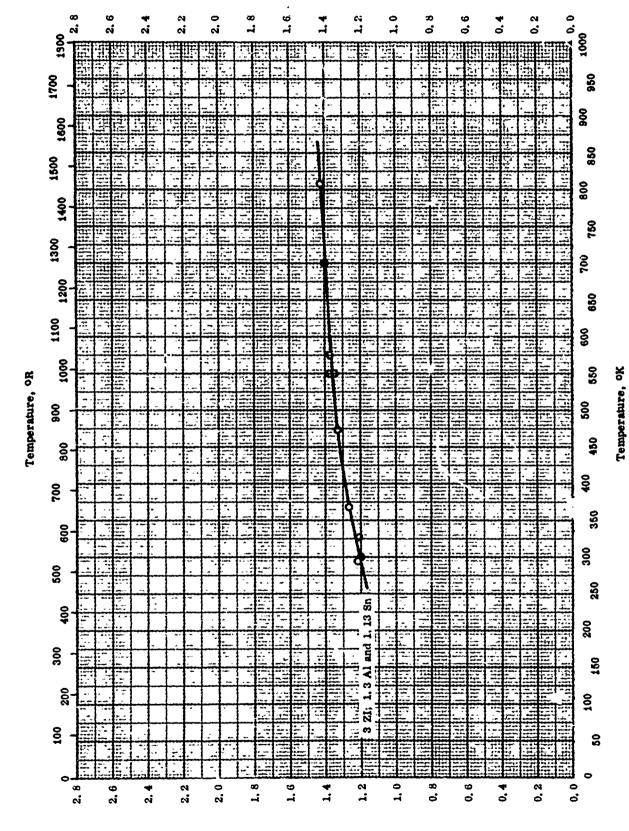


Density -- Zirconium + Aluminum + Σx_i

Density, g cm-1

Density -- Zirconium + Aluminum + Σx_1

Remarks	Calculated from ransverse thermal expansion.	Calculated from longitudinal thermal expansion.	
Sample Specifications	Alloy 3 ZI; 1.3 Al, 1.13 Sn, and 0.85 Mo.	Same as above.	
Rept. Error%			
Temp. Range ok	6	294-1089	
Ref.	61-9	61-9	
Sym	O	•	



ELECTRICAL RESISTIVITY -- ZIRCONIUM + ALUMINUM + DXI

Electrical Resistivity, ohin cm x 10^4

ELEC'TRICAL RESISTIVITY -- ZIRCONIUM + ALUMINUM + ΣX_i

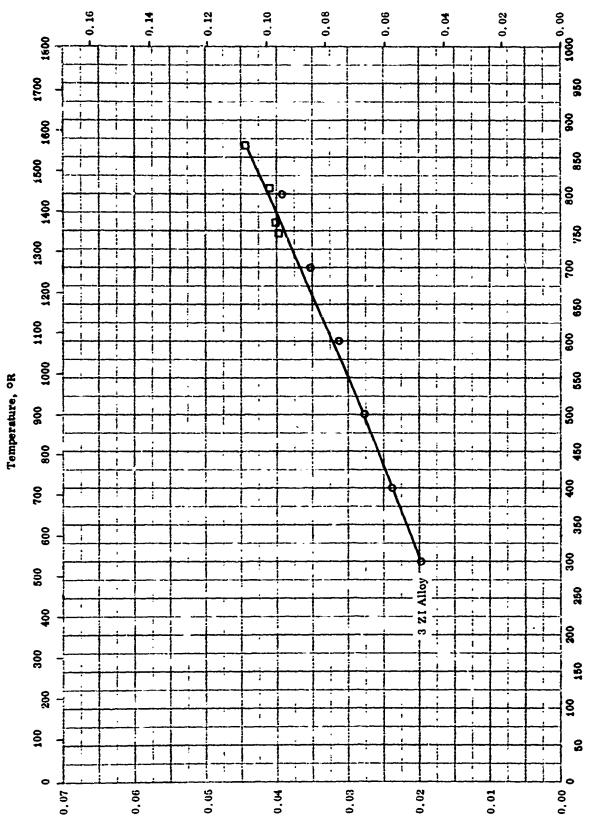
REFERENCE INFORMATION

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THERMAL CONDUCTIVITY -- ZIRCONIUM + ALUMINUM + Σ_{i}

Temperature, oK



Thermal Conductivity, cal Sec-lcm- $^1\,\mathrm{K}^{-1}$

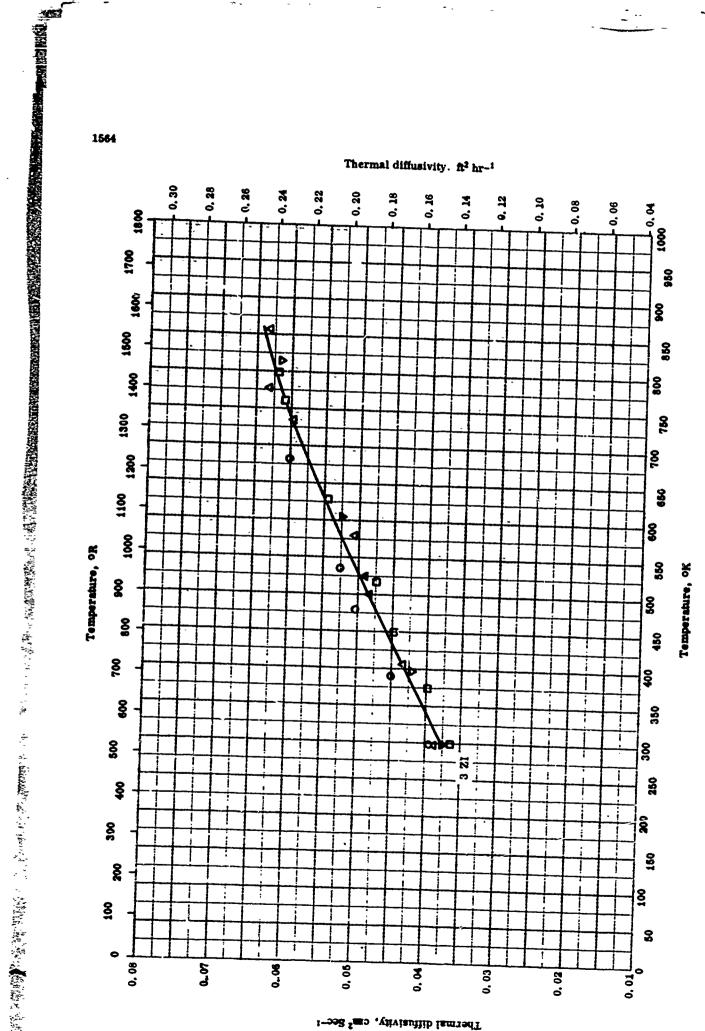
156;;

CONTROL OF THE PROPERTY OF THE

THERMAL CONDUCTIVITY -- ZIRCONIUM + ALUMINUM + EXI

_								
Remarks	Calculated from electrical resistivity dam,		•					
Sample Specifications	3 Zl alloy; 1. 3 Al, 1. 13 Sn, and 0, 86 Mo.	Same as above.						
Rept. Error%								
Temp. Range ok	309-800	747-866		 	-			
Ref.	63-3	61-9						
Sym	0	0		 			 	

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Thermal diffusivity -- zirconium + aluminum + Σx_1

1565

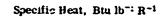
THE PROPERTY OF THE PROPERTY O

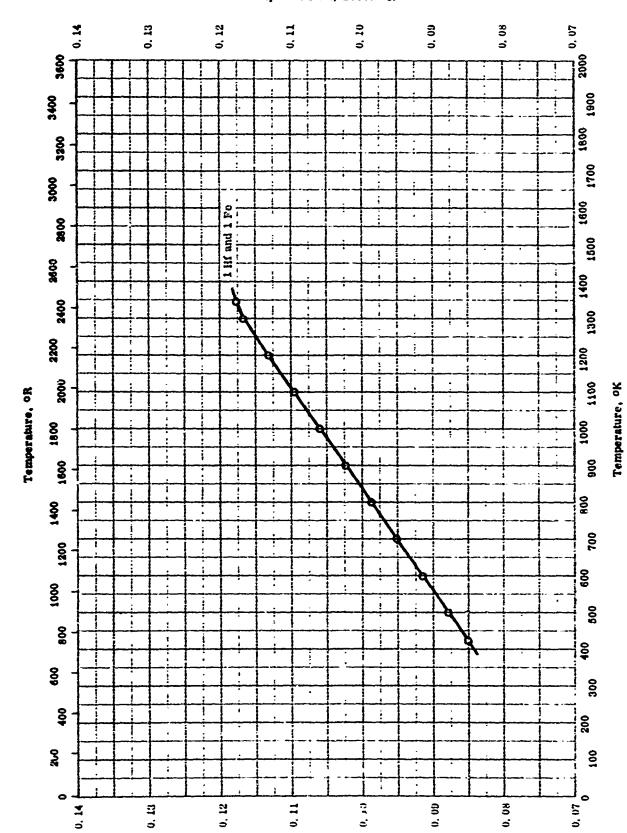
THERMAL DIFFUSIVITY -- ZIRCONIUM + ALUMINUM + EX

Remarks		Another run.	Anothor run.	Ancther run.	
Sample Specifications	3 Zi; 1.3 Al, 1.13 Sn, and 0.85 Mo; apparent density 6.42gcm ⁻³ . [Author's design, 13ZI-1].	Same as above. [Author's design: 3 ZI-2].	Same as above. [Author's design, : 3 ZI-3].	Same as above. [Author's design. : 3 ZI-4].	
Rept.	.	6	ಬ	ဘ	
Temp. Range OK	298681	298-799	298-857	298-815	
Rof.	63-3	63-3	63-3	63-3	
E S	0	۵	٥	٥	



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SPECIFIC HEAT -- ZINCONIUM + HAFNIUM + ZXI

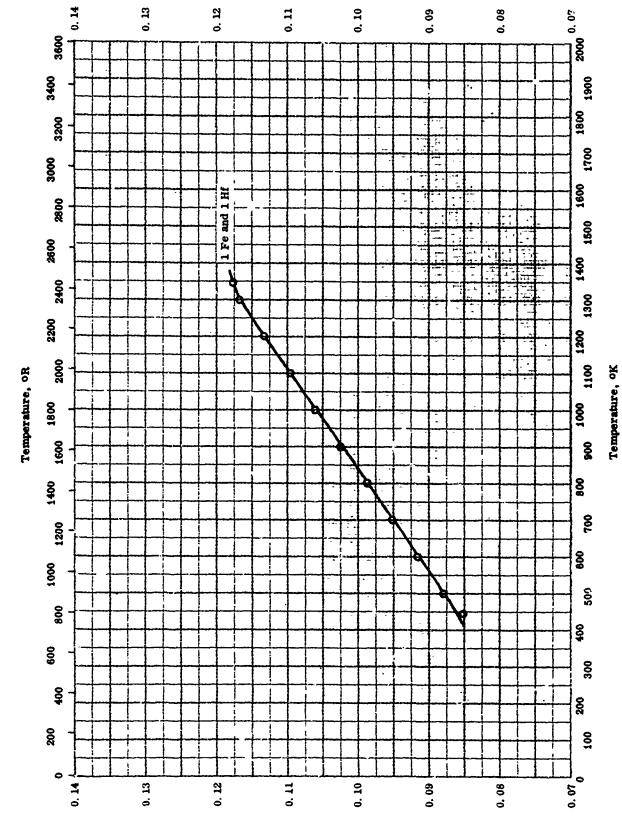
Specific Heat, cal g⁻¹ K⁻¹

the design

AND SECTION OF SECTION

Specific heat -- zhconum + hafnum + Exi

Romarks	
Sample Specifications	1. 0 Mf, 1. 0 Fo, 0. 04 Mg, < 0. 04 Ba, < 0. 04 Cd, 0. 02 Cu, 0. 02 Wi, 0. 02 Ni, 0. 01 Si, 0. 004 Ca, 0. 004 Ti, 0. 002 Cr, 0. 002 Ph, < 0. 002 Sn, < 0. 002 V, and < 0. 002 B others.
Rupt.	၁ ဂ် ^၃
Temp.	422-1270
Ref.	1, 27
#0 %	0



SPECIFIC HEAT -- ZIRCONIUM + IRON + EX

Specific Heat, cal g": K"!

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SPECIFIC HEAT -- ZIRCONIUM + IRON + ΣX_i

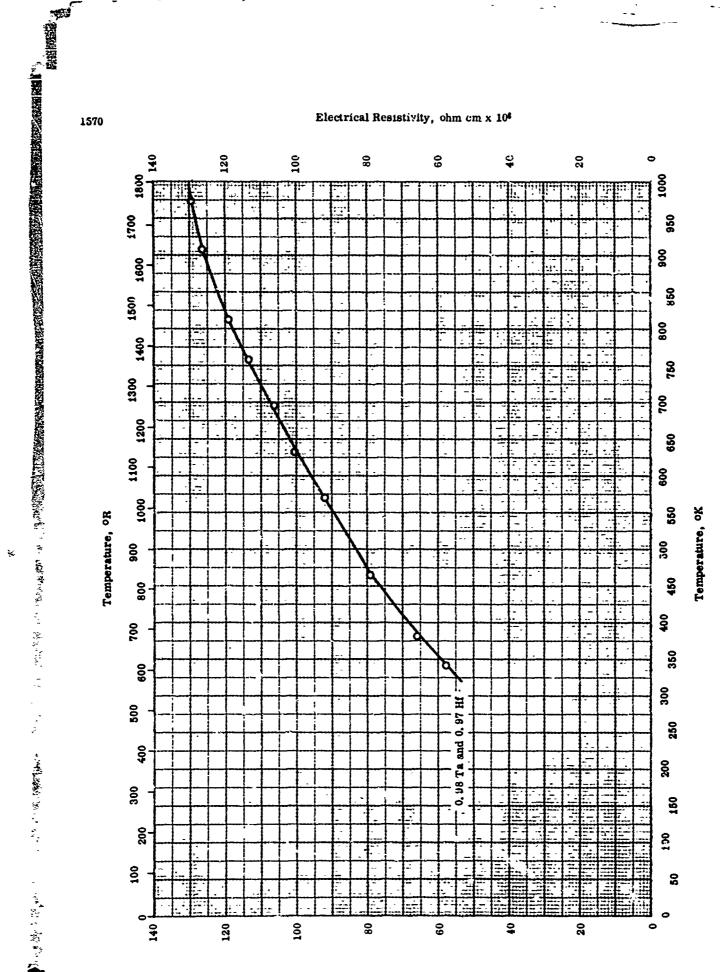
REFERENCE INFORMATION

Remarks	
Sample Specifications	1. 0 Fe, 1. 0 Hf, 0. 04 Mg, < 0. 04 Ba, < 0. 04 Cd, 0. 02 Cu, 0. 02 Mi, 0. 01 Sl, 0. 004 Ca, 0. 004 Ti, 0. 002 Cr, 0. 002 Pb, < 0. 002 Sn, < 0. 002 V, and < 0. 0028 others.
Rept. Error %	
Temp. Rarge ^O K	422-1279
Ref.	42-1
Pom	0

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ELECTRICAL RESISTIVITY -- ZIRCONIUM + TANTALUM + \(\Subseteq \)



 E_i ectrical Resistivity, ohm cm x 10^6

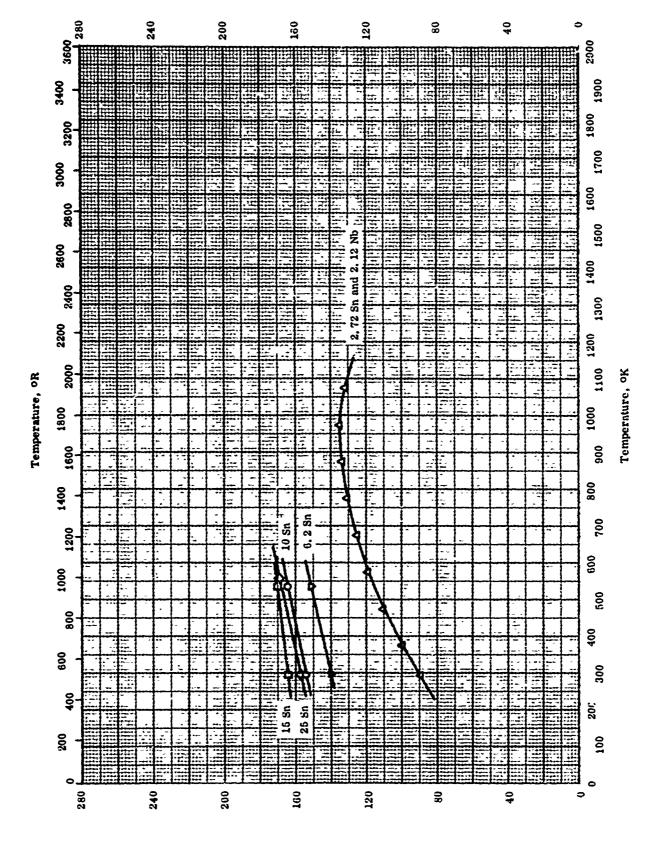
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ELECTRICAL RESISTIVITY $\sim ZIRCONIUM + ZIRUM + ZIRIUM + Z$

REFERENCE INFORMATION

Remarks	Annealed 48 hrs at 600 C in vacuum and water quenched,
San:ple Specifications	0, 98 TB, 0, 97 Hf, R3d 0, 03 C.
Rept. Error%	
Temp. Range ok	342-971
Ref.	2-2-
E 28	0

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electrical resistivity -- zirconium + $\text{tin} + \Sigma x_1$

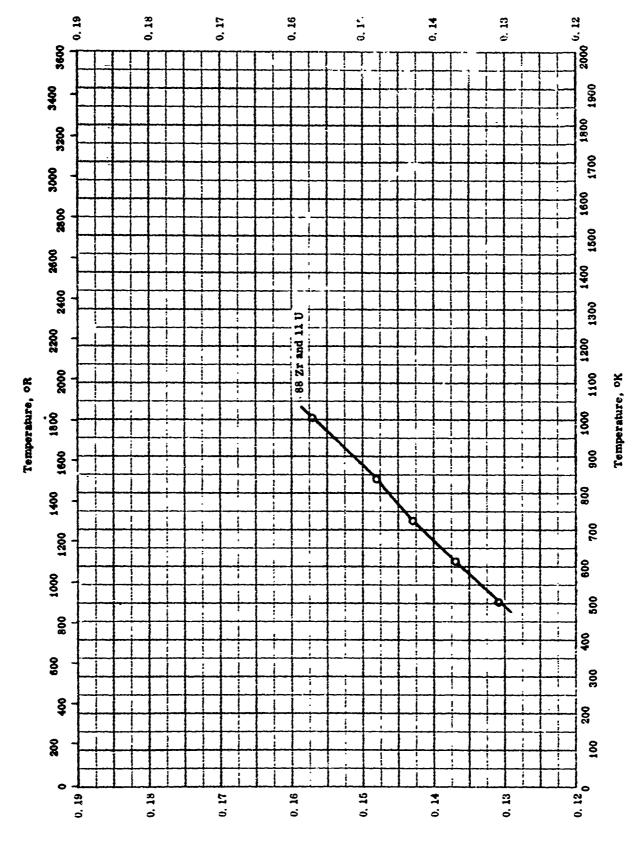
Electrical Resistivity, ohm cm x 106

THE PROPERTY OF THE PROPERTY O

ELECTRICAL RESISTIVITY -- ZIRCONIUM + TIN + Σx_i

REFERENCE INFORMATION

		·	 -			 	 		
Remarks	Induction melted; tested as cast.	Same as above.	Same as above.	Same as above.					
Sample Specifications	10 Sn; actual: 8.94 Sn, 0,80 Hf, 0.34 C, 0.13 Fc, 0,035 Al, 0.026 N, and 0.004 Ti.	15 Sn; actual; 10,8 Sn, 0,80 Hf, 0,35 C, 0,14 Fe, 0,03 Al, 0,027 N, and 0,004 Tl.	26 Sn; actual: 24.6 Sn, 0.79 Hf, 0.30 C, 0.14 Fc, 0.035 Al, 0.029 N, and 0.004 Tl.	6.20 Sn, 0.8 Hf, 0.37 C, 0.13 Fe, and 0.1 > total of N, Al, and Tl.	2.72 Sn, 2.12 Nb, 0.071 Fc, and 0.006 Cr.				
Rept. Error%	 +	# 1	4	~ #					
Temp. Range ^o K	298-533	208-533	298-533	208-533	293-1073			-	
Ref.	61-7	51-7	61-7	2-19	61-21		 		
E SO	0	0	♦	D	٥	 	 		



Specific Heat, cal g"1 K"1

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SPECIFIC HEAT -- ZIRCONIUM + URANIUM + EXI

1575

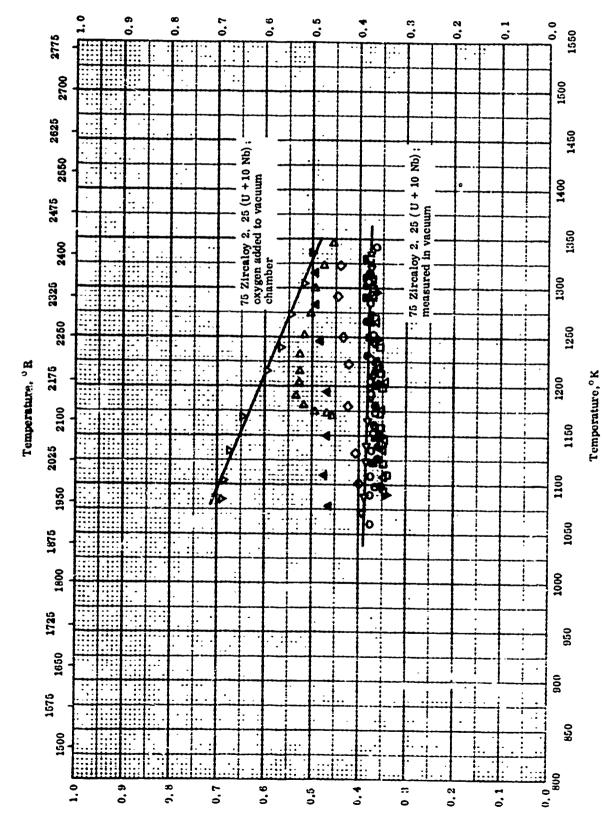
A CANADA MANAGEMENT OF THE STATE OF THE STAT

SPECIFIC HEAT -- ZIRCONIUM + URANIUM + EXI

REFERENCE INFORMATION

Remarks	ilydrogen atmosphere.
Rample Specifications	87. 92 Zr, 10, 58 U, and 1, 5 H ₂ ; density 383 lb ft ⁻³ .
Rept. Error%	4 2.0
Temp.	477-1170
Ref.	63-12
#38 200	0

i. S 3.



Hemispherical total emittance -- zirconium + uranium + Σx_1

Hemispherical Total Emittance

1577

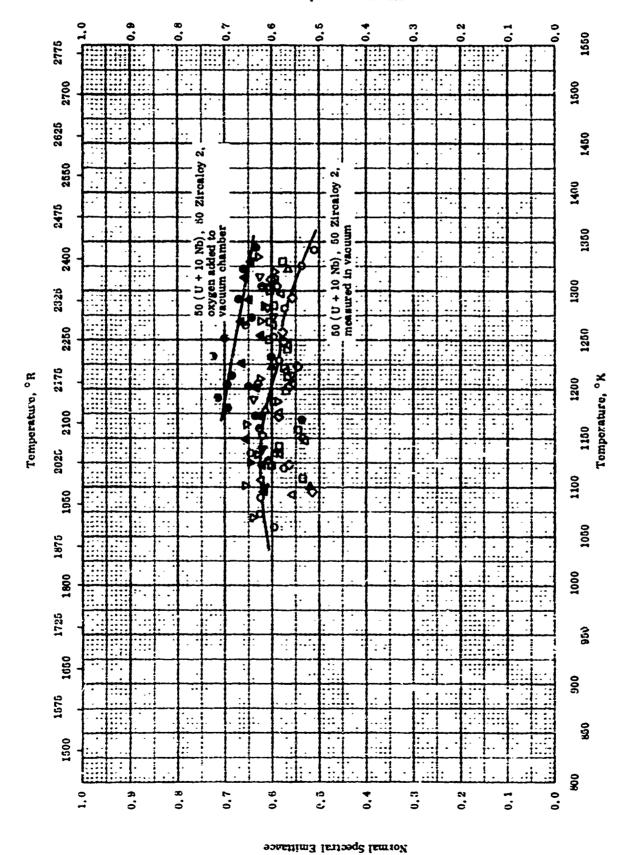
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Hemispherical total emittance -- zirconium + uranium + Σx_i

REFERENCE INFORMATION

Sym	Ref.	Temp.	Rept.	Sample Specifications	Remarks
0	67-49	1069-1342		50 Zircaloy 2 and 50 (U + 10 Nb); 49.1 Zr, 45 U, 5 Nb, 0.75 Sn, Rolled at 815 C then annealed, quenched, and cold 0.075 Fe, 0.05 Cr, and 0.025 Ni.	Rolled at 815 C then annealed, quenched, and cold rolled; measured in vacuum; first heating.
٥	67-49	1093-1308		Same as above.	The above specimen; first cooling.
0	57-49	1109-1330		Same as above.	The above specimen; second heating.
>	67-49	1091-1311		Same as above.	The above specimen; second cooling.
Δ	57-49	1169-1345		Same us abovo.	The above specimen; 20 charges (2, 5 cm ³ at atmos-
					pheric pressure per charge, of oxygen added to vacuum chamber (chamber at 2 x 10 ⁻⁵ mm lig and specimen at approximately 1173 K); first heating.
\(\)	57-49	1101-1323		Same as above.	The above specimen; first cooling.
∇	67-49	1071-1335		75 Zircaloy 2, 25 (U + 10 Nb); 1.c. 73.672 Zr, 22.5 U, 2.5 Nb, 1.125 Sn, 0.075 Cr, 0.09 Fu, 0.038 Ni.	Rolled at 815 C then anneated, quenched, and cold rolled; measured in vacuum; first heating.
•	57-49	1099-1316		Same as above.	The above epecimen; first cooling.
	67-49	1123-1330		Same as above.	The above specimen; second heating.
•	87-40	1097-1303		Same as above.	The above specimen; second cooling.
٥	67-49	1085-1336		Same as above.	The above specimen; oxygen added to vacuum chamber (chamber at 2 x 10 ⁻⁵ mm Hg); fixst heating.
4	67-49	1078-1316		Same as above.	The above specimen; first cooling.

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normal, spectial emittance -- zincunium + uranium + ex,

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Normal spectral emittance -- zirconium + uranium + Σx_1

REFERENCE INFORMATION

6 - S	Rof.	Wavelength	Temp. o.K.	Ropt.	Sample Specifications	Remarks
0	07-40	0, 66	1055-1343		60 (U + 10 Ni) and 50 Zhronloy 2; 49,1 Zr, 48 U, 6 Nb, 0,76 Sn, 0,076 Fo, 0,08 Cr, and 0,026 Ni.	Rolled at \$15 C then annealed, quenched, and cold rolled; measured in vacuum; first heating,
٥	07-40	0.64	1003-1508		Same an al we.	The above specimen; first cooling.
ם	04-40	0, 35	1109-1330		Same an above.	The above specimen: second heating,
\ \	07-40	0, 03	1001-1311		Same an above.	The above specimen; second cooling.
•	6710	0, 68	1100-1340		Eame in above.	The above appointent 20 charges (2.5 cm ³
						oxygen activates probate per charge) of oxygen activates to vacuum chamber (chamber at 2 x 10° b mm Hg and appelmen at approximately 1173 K); (trut heading,
Δ	07-40	c, 06	1x01-1322		Same an above.	The above apcolmen; first cooling.
D	6749	00.00	1071-1336		25 (U+10 Nb) and 76 Zircaloy 2; 73,672 Zr, 22,6 U, 2,5 Nb, 1,125 Kn, 0,076 Cr, 0,09 Fe, and 0,038 Ni,	Nolled at 815 C then annealed, quenched, and cold rolled; measured in vacuum; first heating.
V	04-10	0.08	1100-1316		Same as above.	The above speet men; first cooling.
4	87-40	0, 65	1080-1330		Same as above.	The above specimen; second heating.
•	67-40	0.46	1008-1304		Вато им проус.	The above specimen; second cooling.

PROPERTIES OF ZIRCONIUM $+\Sigma X_{i}$

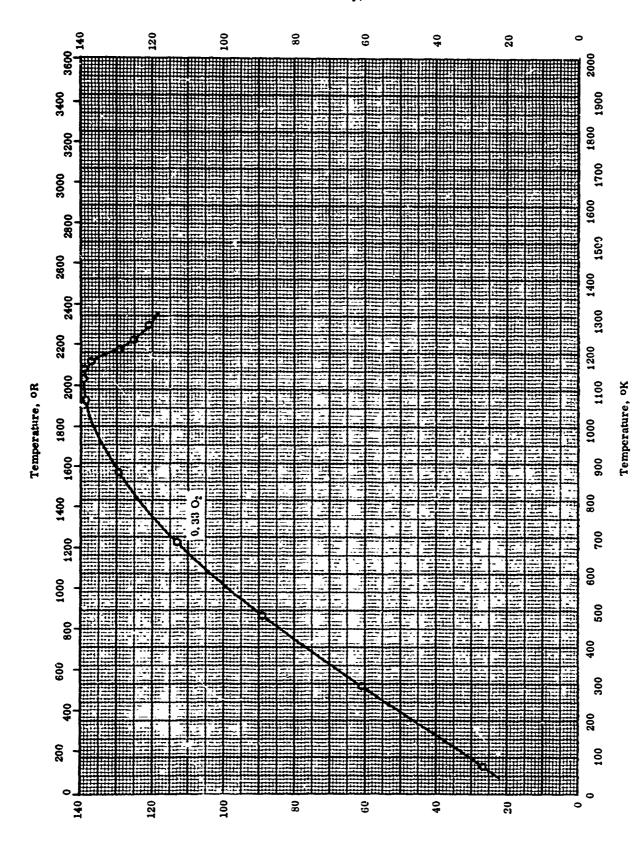
REPORTED VALUES

Density $g \text{ cm}^{-3}$ lb ft⁻³ O 99⁺ pure 6.499 405.7

Properties of zirconium $+\Sigma x_1$

REFERENCE INFORMATION

Remarks	Average density of 4 samples by weighting in air and distilled water.			
Sample Specifications	90 ⁺ pure.			
Rept. Error %				
Temp. Range ^O K	300			
Ref.	50-15			
Sym	0			



FLECTRICAL RESISTIVITY -- ZIRCONIUM + EXI

Electrical Resistivity, ohm cm x 10s

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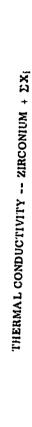
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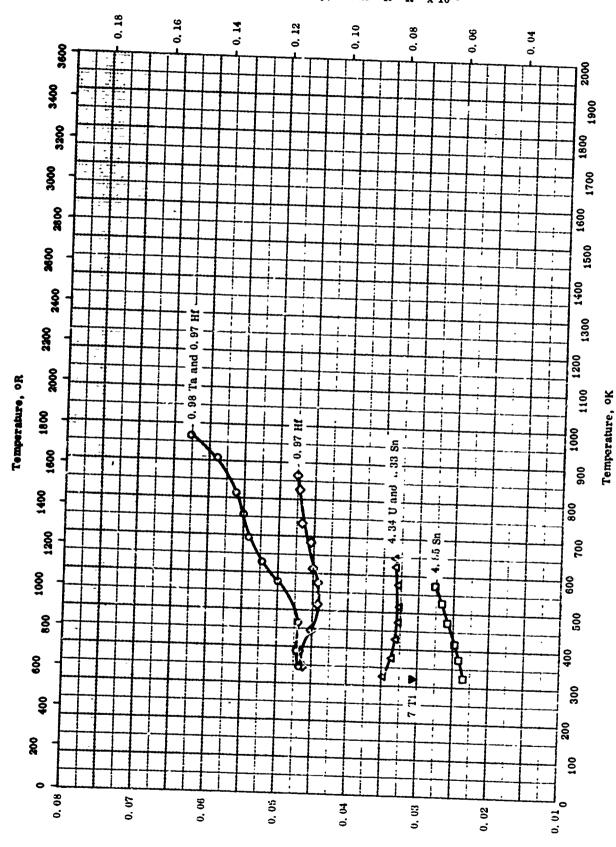
ELECTRICAL RESISTIVITY -- ZIRCONIUM + ΣX_i

REFERENCE INFORMATION

Remarks							
Sumple Specifications	0, 33 O ₂ , 0, 051 Fe, 0,						
Rept.							
- 1	Range ^O K 73-1273						
Ref					 	-	

4.





Thermal Conductivity, cal Sec-1 cm-1 K-1

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THERMAL CONDUCTIVITY -- ZIRCONIUM + \(\Sigma\)XI

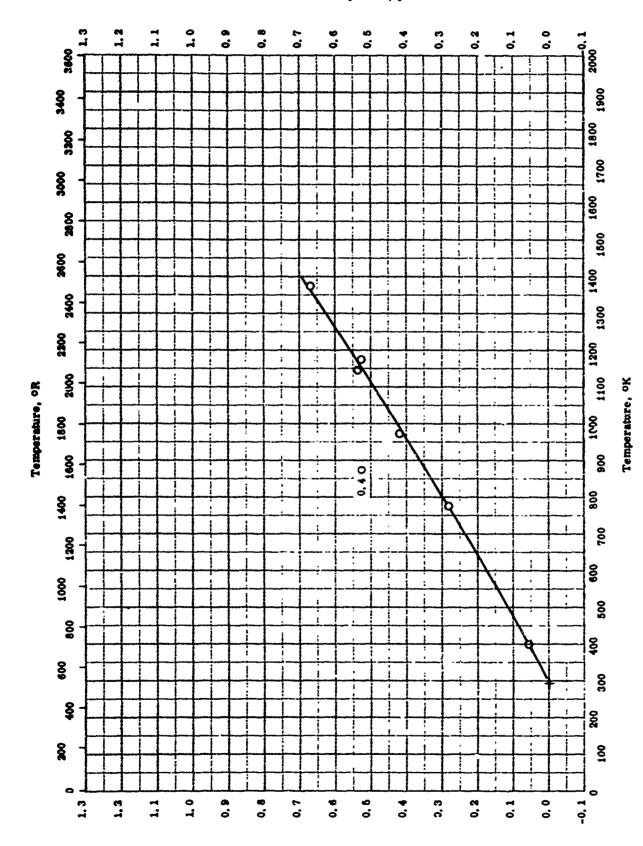
REFERENCE INFORMATION

ـــ					
Remarks	Annealed 48 hrs at 600 C in vacuum; water quenched.	Same as above.		In Argon atm.	Prepared from loro Hf crystal bar; double arcmelted and forged at 1650 F.
Sample Specifications	0.98 Ta, 0.97 Hf, and 0.3 C.	0.97 Hf and 0.3 C.	7 Ti.	4.34 U, 1.33 Sn, 0.125 Fo, 0.09 Cr, 0.04 B, 0.027 Ni, and 0.013 N ₂ .	4. 86 Sn, 0. 23 Fo, 0. 12 C, 0. 024 Hf, 0. 014 Ti, 0. 009 Al, 0. 007 N, and 0. 006 Ni.
Rept. Error%					es +
Temp. Range ok	343-972	339-864	320	323-673	323-673
Ref.	57-7	57-7	54-5	g-83	51-7
Sym	0	♦	>	٥	0

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Thermal Macar Expansion, percent

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Thermal linear expansion -- zirconium + Σx_1

THERMAL LINEAR EXPANSION -- ZIRCONIUM + ΣX_1

REFERENCE INFORMATION

Remarks	Sintered bar.	
Sample Specifications	0.40, < 0.05 Hf, and 0.02 N.	
Rept.		
Temp. Rango oK	298-1373	
Ref.	62-22	
Eog Pol	0	

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AISI C1919	• • • • •	- 1	_ [340	-	-	-	312	316	325	223	335	-	-	-	-	-
AISI C1929	I	3	_ [- [- 1	-	-	- 1	-	-	333	- [-	- [-	-	- [
AIS CIPS	1	3	-	-	-	-	-	-	-	-	329	i	347 347	-	-	-	-
1		3	- [- j	-	-	- 1	-	-	-	333	-	-	-	-	-	- [
ASS 3140	1	3	-	-	-	-	-	-	-	-	363	-	-	-	-	-	-
AISI 4130		3	-	-	-	-	-	-	-	-	55	- [-	-	-	-	-
1		3	-	-	-	-	-	-	-	397	395	-	-	-	-	-	-
AISI 8630 Akermante		3	-	-	-	-	-	-		-	-	337	-	-	-	- [-
Akermane		+-0		<u> </u>	-	- 1	-	-	1239	-	-	-	-	-	-	- [-
Albert 1005		i	1636	_	-	-	-		-	-	-	- [-	- [-	-	-
ADETA IVES	• • • •	6-II	-	-	-	-	-	1952	-	-	-	-	-	-	-	-	-
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TO SECTION OF THE PROPERTY OF

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Material Name	Volumo	Denaily	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Nublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal IMfusivity	Therinal Linear Kapanston	Thermal Absorptance	Thermal	Thermal Neflectance	Thermal	Vapor Pressure
Alberit \$391-60	6-U 1	-	-	-	-	-	1953	-	-	-	-	-	-	-	-	-
Alkali and alkaline earth alumi- sum berosilieste gloss	4-E	-	-	-	-	-	-	-	_	-	1715	-	19	_		_
Allgrd-isocyanate fours	6-11	552	-	-	-	-	-	354	956	_	95-3		_			-
Alternian	4-1	3	3	-	-	3	5	8	11. 15	29	22- 26	-	25- 22	34	377	25
Alemina + Malike	4-11	-	-	-	-	-	-	_	1534	-	_	_	-	١.	l _	_
Alumbide costing on mishier	6-II	-	-	-	-	-	-	-	-	-	-	-	1435- 1437	i439	-	- -
	6-B	-	-	-	-	-	-	-	-	-	-	-	141- 143	1445	-	-
Aluminide conting on titunium	€-11	-	-	-	-	-	-	-	-	-	-	-	1467- 1449	1451	-	-
	6-E	-	_	_	_		_									
Aluminon (Al)	1	7	7	7	7	7	3	11	13	- 12	17	-	- 15- 21	1497 25	- 23	- 36
Aluminum clast boron carbide	5	2.3	-	_ [-	-	-	341	_	_	_	_	23			
Aluminum conted with silicon (dl-)oxide	6-B	-	-	_	-	-	-	-	_	_		_	-	-	-	-
	C-2	-	-	-	-	-	-	_	_ i	_	_	_	•		-	_
Alexander costing on mylar	GE	-	-	-	-	_	-	-	_	_	_ 1	_	_	1157	_	
The state of the s	2	-	-	-	-	-	-	-	_	_	_]		19	_		-
Aleminum + EX ₁	2-E	-	- [-	- İ	-	-	_ [233	sm l	_		_	_	-	-
	2-4	-	- 1	-	- 1	_	_	_		_	3	_		_	_	-
Aluminus: + Besyllium + EX;	2-2	-	- i	-	_	_	_	.	_	_ [729	_ [-	-
	2-1	-	- [-	-	- 1	s	7	•	_	11	_		_	_	-
_	2-2	731	731	731	-	-	733	73E	735- 739	741	733	-	754- 757	756	-	-
	2-3	- i	-	-	- !	-	- [-	23	- 1	-	- Ì	_ [_		
	2-4	- ļ	-	-	-	-	15	- 1	17	-	- [-	_ [_ [_ [
	2-2	203	363	-	-	-	363	-]	363	-	763	- 1	771	723		
	2-4	-	- j	-	-	-	-	-	-	-	-	-	19- 21	-	-	-
	2-2	-	-	-	-	-	775	-	773	-	791	-	-	-	-	- [
	**	-	-	-!	-	-	-	- {	-	-	=	-	-	-	- 1	- [
	2-E		-	-	-	-	785- 785	-	734	-	735 994	-	-	-	-	-
		an an	-	-	-	=	Zī	29	-	- [- !	-	-	- [-	-
Aleminum + Cranium	4	-	-	-	-	-	-	-	31	-	34	-	-	-	-	-

Mate Nar		Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittaice	Thermal Reflectance	Thermal Transmittance	Various Description
Aluminum + Zinc	$+\Sigma x_i$	2-11	806	806	806	-	-	808	810	812	814	816	-	818- 923	825	-	-
luminum alloys designations)	(Special													323			
28		2-11	_	١.	_	_	_			829	831						
148		2-11	-	-	-	-	_	:	:	739	-	-	-	-	-	-	-
178		2-11	-	_	۱.	_	_		_		_	743	_	-	-	-	-
248	• • • • • •	2-11	731	-	-	-	-	-	735	737	741	745	-	- 754-	- 759	-	-
75S		2-11	806	-	-	-	-	-	₹10	812	814	8.6	-	757 818-	825	-	_
1075		1	-	-	-	-	_	-	_	_	_	_	_	823		_	_
1100	• • • • •	2-11	-	_		_	-	_	_	_	831	1		1	25		
2024	• • • • • •	2-11	731	-	-	-	-	-	735	737	741	745	-	754	759	-	-
2219		2-11	-	_	_	_	_	_	_	_	ļ	ļ		757	- 1		
3003	• • • • •	2-J	-	-	-	-	-	-	-	-	-	-	-	19-	159	-	-
6031		2-II	-	_	_	_	_	ļ	_			1		21	1	- 1	
7075	• • • • • •	2-II	806	-	-	-	-	-	810	812	814	816	-	771 818-	773 825	-	-
Alpax Gamma		2-11	-	_	_	_	_	785			ļ			823	l	i	
C-46		2-11	731	731	731	_	_	165	-	794	-	802	-	-	-	-	-
Duralite		2-11	731	731	731	-	_	_	-	739		747	-	-	-	-	-
Gamma, y		2-П	-	-	_	-	-	_	_	-35		743	-	-	-	-	-
Hydronalium 5		2- <u>I</u>	-	-	_	- !	-	15	_	17	_	-	-	-	-	-	-
Hydronalium 7		2-11	- i	.	-	-	-	765	_	767	_	ļ	_	-	-	-	-
Hydronalium 51		2-11	-	- ¦	_	-	-	765	_	767	_	-	_	_	-	-	-
L'A-Z5G		2-11	306	806	806	-	-	808	810	812	_	816			-		-
Lo-Ex	• • • • • •	2-11	-	-	-	- [-	785	-	794	-	798	_	_	_		-
RAE 40C		2-II	-	-	-	-	-	775	-	778	-	781	-	_	_	_	_
RAE 47B	• • • • • •	2-II	-	-	-	-	-	775	-	778	-	781	-	_	_	-	_
RAE 47D		2-11	-	-	- [-	- j	775	-	778	-	-	-	-	_	_	_
RAE 55		2-11	-	-	- [-	-	775	-	778	-	781	-	-	-	-	_
RAE 470		2-11	-	-	-	-	-	-	-	-	-	781	-	-	-	-	_
RAE SA1		2-II	-	-	-	-	-	785	-	792	- 1	798	-	-	-	-	_
RAE SA44	i	2-11	-	-	-	-	-	785	-	792		798	-	-	-	-	_
RR50		2-11	- 1	-	-	-	-	783	-	-	-	796	-	-	-	-	_
RR50C RR53C		2-П	-	-	-	-	-	-	-	788	-	-	-	-	-	-	_
RR59 RR59	1	2-11	-	-	-	-	-	783	-	788	-	796	-	-	-	-	_
RR7?		2-11	-	-	-	-	-	733	-	739	-	745	-	-	-	-	-
RR 131D	1	2-11	-	-	-	-	-	903	- ¦	812	- :	816	-	-	-	-	_
	i i	2-11	-	-	-	-	-	765	-	767	- •	769	-	-	-	-	-
Thermsiond C3-	ına 2	2-II	731	731	731	-	-	-	-	739	- '	743	-	-	-	-	-

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Material Name	Volune	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Aluminum alloys (Special designations) (cont.)																
Υ	2-11	-	-	-	-	-	733	-	739	-	-	-	-	-	-	-
Aluminum antimonide (AlSb)	6-1	-	i -	-	-	-	45	47	-	-	49	-	-	-	-	-
Aluminum borate (2Al ₂ O ₃ ·B ₂ O ₃)	4-11	-	-	-	-	-	-	-	-	-	-	-		-	-	1035
Aluminum borides				1												1
AlB ₁₀	6-1	-	160	-	-	-	-		-	-	-	-	-	-	-	-
AlB ₁₂ Aluminum bubbles - graphite fibers composite system	6-II	-	160	-	-	-	162	-	1279	-	-	-	-	-	-	-
Aluminum carbide (Al ₄ C ₃)	5	_	294		_	_	_	_			-	-	_		-	-
Aluminum carbide + Aluminum oxide	5	-	-	_	-	-	•	803	-	-	_	-	-	, ,	-]
Aluminum-chromium- molybdenum cermets	6-11	930	-	-	-	_	-	-	_	_	_	_	-	_	_	
Aluminum fluoride (AlF ₃)	5	407	407	-	_	407	_	_	_	_	_	-	_	-	_]
Aluminum-nickel-titanium cermets	6-11	925	-	-	-	-	-	_	-	-	-	_	_	_	-	_
hluminum niobate (Al ₂ O ₃ ·Nb ₂ O ₅)	4-11	-	1121	-	-	-	-	-	-	-	_	-	-	_	_	-
Aluminum nitride (AIN)	5	481	481	-	-	-	-	483	485	-	487	-	489- 491	493	-	-
Aluminum oxides)					ļ										1
Aluminum oxide (Al ₂ O ₃)	4-7	3	3	-	-	3	£	8	11- 18	20	22- 26	-	28- 32	34	37	39
38-900	4-I	-	-	-	-	-	-	-	11	-	-	-	-	-	- 1	-
AD-85	4-I	-	-	-	-	-	-	-	-	-	-	-	337	-	639	-
AD-94	4-1	-	-	-	-	- (-	-	-	-	-	-	637	-	639	-
AD-96	4-1	-	-	-	-	-	-	-	-	-	-	-	32	-	37	-
AD-99	4-1	-	-	-	-	-	-	-	-	-	-	-	32	-	37	-
AD-995 AP-30	4-1	-	-	•	-	-	-	-	~	20	-	-	32	-	-	-
AP-35	4-1	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-
AV-20	4-I 4-I	_	-		-	-	-	-	-	20	-	~	32	-	37	-
FS-54	4-1	_		_	-	_	-	-	~	-	-	-	32	-	37	-
GD-10	4-1	_	_		_	-	_	-	-	20	_	_	-	-	-	-
Gulton HSB	4-1	_	_	_	_	-	-	-	- 11	20	-	_	-	-	-	-
LA-603	4-I	-	-	-	-	-	-	-	-	-	-	-	28-	-	-	-
RA-4213	4-1	-	-	-	-	-	-	-	-	-	-	-	30 28- 30	-	<i>'</i> -	-
TWA 2, A402	4-1	-	_	-	-	-	_	_	_	_	_	-	30 32	_	_	-
Wesgo Al-300	4-1	-	_	- 1	_ [-	_	_	14	_	_	-	32	_	_	_
Aluminum oxide foam	4-1	-	_	-	-	-	-	-	18	_	26	-		_	_	
Aluminum exide reinforced by						1	1					ı]
molybdenum fibers	6-II	-	-	-	-	-	-	-	1261	-	1263	-	-		-	-

Material Name		Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of	Electrical	Resistivity	Specific Heat	Thermal Conductivity	Thermal	Aurustwity	Inermal Linear Expansion	Thermal Absorptance	Thermal	hermal	Reflectance	Transmittance	Vapor Pressure
Aluminum oxide coating on AISI 446	. 6	-11 .							1			-	+		> 4	F- 6	F	Æ E	F	<u>></u>
Aluminum oxide $+ \Sigma X_1$. 4	-[]]		-	-	-	-		-	-	-		-	-	1349	- 1		-	_
Aluminum oxide + Aluminum cermet	1			.	-	-	-	-		-	-	-	16	35	-	637	· -		339	-
Aluminum oxide + Aluminum		-11 -	· -		-	-	-	-		-	-	-	7	29	-	-	-		-	_
Aluminum oxide + Beryllium oxide + Magnesium oxide .	. 4.]	-		-	-	-	-		-	L534	-		-	-	•	-		-	-
Aluminum oxide + Chromium cermet	6-				-	-	-	-		-	-	-	5.	99	-	-	-		-	-
Aluminum oxide + Chromium (sesqui-) oxide		1			-	-	-	-		-	911	-	7:	33	-	735	-		.	-
Aluminum oxide + Chromium + + Molybdenum carmet	6-		7 -			-	~	601			-	-	60)3	-	605	-	-	•	-
Aluminum oxide + Iron cermet .	6-1	u -	-	!_	- 1	_	-	-		.	-	-	73		-	-	-	-	.	-
Aluminum oxide + Magnesium oxide + Beryllium oxide	4-1							_	-		-	-	74	1	-	-	-	-	.	-
Aluminum oxide + Nickel aluminide	5						-	-	-		-	-	60	7	-	-	-	-		-
Aluminum oxide + Nickel (mon-) oxide							-	-	-	İ	-	-	-		-	747- 743	751	-		-
Aluminum oxide + Niobium (pest-) oxide	4-1	-	-	-		-	-	-	-		-	-	-		-	609	-	-		-
Aluminum oxide + Silicon (di-)oxide	4-1		631	-		-	-	-	-		-	-	-		-	-	-	-	.	-
Aluminum oxide + Silicon (di-) oxide + Titanium (di-) oxide	4-1		-			-	-	613	-	6	15	-	617	-	• •	61 9	-	-	-	•
Aluminum oxide + Thorium (di-)oxide		-	-	-	'	-	-	-	-	6	21	-	-	-	. .	- [-	-	-	.
Aluminum oxide + Thorium (di-)oxide + Beryllium oxide	4-1	-	623	-	-	-	-	-	-	-	•	-	-	-	.	-	-	-	-	
Aluminum oxide + Titanium aluminide	4-1 5	-	625	-	-	•	-	-	-	-		-	627	-	-	-	-	-	-	
Aluminum oxide + Titanium (di-)oxide + Chromium + + Molybdenum cermet		-	-	-	-		-	-	-	-		-	•	-		53- 55	757	-	-	
Aluminum oxide + Tungsten +	6-11		-	-	-		-	-	-	-		-	-	-	74	17	-	-	-	
Aluminum oxide + Uranium	6-II 4-I	629	-	-	-		-	-	-	-		-	743	-	74	5	-	-	-	
Aluminum oxide + Zirconium	4-1		-	•	-	'	-	-	-	-		-	-	-	-		-	-	-	
Aluminum oxide + Zirconium	1-1	_	-	-	-		-	-	-	63	· ·	-	-	-	-		-	-	-	
Aluminum phosphate coating on	-11		633	_	-	-		-	-	-	'	•	-	-	-		-	~	-	
Aluminum phosphide (AiP)		-	-	-	-	-			- 627	-			•	<u>-</u>	1429	•	-	-	-	

Materiel Name	Volume	Density	Melting Point	Heat of Furton	ilaat of Vaporination	ileat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Edifusivity	i'hormal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Aluminum silicates	4-11	-	-	-	-	-	1187	1189	1191	1193	1195- 1197	-	1199- 1201	-	1203	-
Al ₂ O ₂ ·SiO ₂	4-11	-	- 1	-	_	_	_	1189	1191	-	1195	_		-	_	_
3 Al ₂ O ₂ ·2 SiO ₂	4-11	-	-	_	_	_	-	1189	1191	1193	1197	_	1501	_	1203	-
Aluminum silicate + Aluminum oxide	4-11	-	_	_	_	-	_	-	1562	_	_	-	-	-	-	_
Aluminum silicate + Mugnesium oxide	4-11	-	1564	_	_	-	_	-	_		_		_	_	-	_
Aluminum silicate glass	4-11	_	_	_	_	_	_	1675	_	1677	_	_	1679	1681	1683-	_
Aluminum titanate (Al ₂ O ₂ -TiO ₂).		1368	1368	•	-			1370	1372	.011	1374			20.72	1685	
Aluminum titanate (Migog 1102).	7-11	1000	1000	-	-	-	-	13/0	13/2	-	1317	-	-	-	-	-
bonded	5	-	-	-	-	-	949- 983	-	-	-	955 977	-	-			-
Aluminum titanate body	4-11	_	_	_	_	_	_	-		_	1374	_	_	_	_	_
Aluminum-vanadium intermetal- ics (Al ₂ V)	6-I	_	%£3	_	-	-	-	-	_	_	_	_	_		_	_
Alundun	4-1	_	_	_	_	_	_	_	13			_	_		_	
Americium (Am)	1	32	_		_	32	_	-	_	_	-		-	_	_	34
Americium fluoride (AmF2)	5	343	_		343	343	_		_	_	-		-			345
Anaicite	4-11	-		_	-	_	_	1724	Í _	_	_				_	_
Anatase	4-1	445		_		_	_	454	_	_	-		_	-	_	
Andalusite	4-11		_	_	_	_	_	1189	_	_	1195		_	-		
Anilin resin	6-11		_	_	_	_	_	1078	_		_		_			
Anorthite	4-11	_ `	_	_	_	_	_	1233) ~	_	_	_] [
Antimony (Sb)	1	38	36	36	_	_	49	42	44	_	_	_	_	46		
Antimony bismuth telluride (Sb _{2-X} Bi _X Te ₃)	6-1	_			_	-	549	_	551	_	_	_			_	
Antimony sulfide (Sb ₃ S ₃)	5	_	_		_	_	_	643	_]			_	645		
Antimony telluride (Sb ₂ Te ₂)	6-1	543	543	_	_	_	545	-	547		_			-	_	
Anti-nony telluride + Bismuth telluride	6-1	_	_	_			705								_	
Antimony telluride + Indium telluride	6-1	-	-	-	-	-	.00	-	707	-	709	-	-	-	-	-
Antimony-zirconium inter-	6-1	-	-	-	•	-	~	-		-		-	-	-		-
	6-II		683	-	i -	-	-	-	-	-	-	-	-	-	-	-
	1	i	-	-	-	-	-	-	-	-	1012	-	-	-	-	-
	6-II		-	_	-	-	501	58%	1218	567	559	- 592	5 91 .	602	-	-
	1	578		-	-	-	581	36%	363				594, 598		-	-
Armofosm	6-II	962	-	-	-	-	-	-	-	-	966	-	-	-] -	-
Arsenic aluminides		1			l	1	l		1			1	ļ		1	1
AsAl,	6-1	-	43	-	-	-	-	-	-		-	-	-	-	-	-
Asialis	6-1	-	43	-	-	-	-	! - !	-	-	-	-	-	-	-	-
Arsenic sulfide (As ₂ S ₂)	5	-	-	-	-	-	-	647	-	-	-	-	-	-	-	-
Arsenic telluride (As2To2)	6-1	-] -	l -	-	! -	1 -	-	640	l -	-	-	i -	! -	1 -	-

Badelseyite	Material Name	Volume	Density	Melting Point	Heat of Fusion	lieat of Vaporization	Heat of Switmation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	The rmal Roflectance	Thermal Transmittance	Vapor Pressure
Bak-1561 BM-704 6-II 988 988 BM-704 BM-13010 6-II 996 996 BM-13010 BM-13014 6-II 992 992 994 992 994 992 994 994 994 994 994 994	В																
BM-704 6-II 998 998 I IM-704 6-II 998 I IM-3510 6-II 998 I IM-3510 6-II 992 I IM-13014 6-II 992 I IM-13014 6-II IM-3515 6-II IM-3515 6-II IM-13015 6-II IM-13015 6-II IM-13016 6-II IM-13014 6-II IM-14726 6-II IM-14726 6-II IM-15140 6-II IM-151	Baddeleyite	4-1	- !	-	-	-	-	-	-	-	-	585	-	-	-	-	-
BM-704 6-II 998 18M-15014 6-II 996 996 996 BM-13014 6-II 996 992 18M-13035 6-II 998 B 998 BBM-13335 6-II 998 BBM-13335 6-II 998 BBM-13335 6-II 998 BBM-13335 6-II 998 BBM-15140 6-II 998 BBM-15140 6-II 992 BM-15140 6-II 992 992 BBM-15140 6-II 992 992 BBM-17849 6-II 992 BBM-17849 6-II 994 BBM-17849 6-II 1000 1000 1000 BBM-17849 6-II 1045	Bakelites																
isid—3510 6-II 996 997 992 992		6-11	-	- 1	-	-	-	-	- 1	-	-	988	-	-	-	-	-
BM-13014 6-II 992 994 BM-13035 6-II 998 BM-14726 6-II 998 BM-14726 6-II 998 BM-14726 6-II 999 BM-14726 6-II 999 BM-15140 6-II 999 BM-15140 6-II 999 BM-17849 6-II 999 BM-17849 6-II 994 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1645 BAPINE BAD-14/O ₂ 4-II 1645 BAPINE BAD-14/O ₂ 4-II 1777 BM-1848 BAD-14/O ₂ 4-II 1777 BAPINE BANISHE BAD-14/O ₂ 4-II 977 BAPINE BANISHE BAD-14/O ₂ 4-II 1390 BAPINE BANISHE BAD-14/O ₂ 4-II 1390 BAPINE		1 1	-	-	-	-	-	-	-	-	-	998	-	-	-	-	-
BM-13080 6-II 994 BM-13335 6-II 998 998 998		•	-	-	-	-	-	-	-	-	-		-	-	-	-	-
BM - 13335 6-II - - 998 - - 998 -		1 ")	-	-	-	-]	-	-	-	-	-	992	-	-	~	-	-
BM-14316 6-II 998 998 BM-15140 6-II 992 992 992			~	-	-	-	-	-	-	-	-		-	-	-	-	-
BM-14726 6-II 993 993 BM-15140 6-II 992 992 BM-16468 6-II 992 BM-1711 6-II 994 BM-1711 6-II 994 BM-1711 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II 1000 BM-17849 6-II		1 1		-	-	-	-		-		-		-	-	-	-	-
BM-15140 6-II 992 BM-15140 6-II 992 992		1 7		-	-	-	-	-	-	[[-	-	-	-	-
BM-17711 6-II 992 BM-17711 6-II 994 994 994					-	-	-	-	-					-	-	-	-
BM-17711 6-II 994 1000 - DN: 6-II 1045 1000 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045 1045		, ,	1		-		-	-	-	1	-			-	-	-	- [
BM-17849 6-II 1000 DN:		2			-		-	- !	-		-			-	-	-	-
Dh:		· ``i			-		-	-	-					-	-	-	-
Barium dustes BaO·Al ₂ O ₃ 4-II 977 3 BaO·Al ₂ O ₃ 4-II 977		1			-		-	-	-					-	-		-
Baríum alusites BaO · Al ₂ O ₃		1			25		-	-	-	~		1045	-	-	-		-
BaO·Al ₂ O ₃		[27]	-	30	30	-	•	_	-	-	-	-	-	-	-	-	-
3 Ba() Al ₂ O ₃		4.11	_	_	_			-	_			977	_				
Barium aluminum allicate (BaO·Al ₁ O ₃ · 2 SiO ₂)	• •	- 1		_			_	_		1		1 1		-	-		
Barium beryilium titanate Cao Beo TiO ₂	, ,													-	-	-	
Caso Beō Tio2		4-11	-	-	-	-	-	-	1205	-	-	1207	-	-	-	-	-
Barium (hexa-)boride (BaB ₆). 6-1 _ 296 300 302 Barium calcium silicate 4-II 1211 1211	Barium beryllium titanate (BaO·BeO·TiO ₂)	4-II	_	-	-	-	-	-	-	-	-	1390	-	-	-	-	-
Barium calcium silicate 4-II	Barium borate glass	4-11	-	-	_	-	-	-	-	-	_	1609	_	_	_	_	
Barium calcium titanate [(Ca _R Ba _{1-x}) O·TiO ₂]	Barium (hexa-)boride (BaB _g)	6-1	-	296	_	-	-	300	-	-	-	302	_	_	-	_ i	_
[(Ca _x Ba _{1-x})O·TiO ₂]	Barium calcium silicate	4-11	-	-	_	-	-	_	-	-	-	1211	_	_	-	. !	_
Barium carbide (BaC ₂) 5		_															
Barium cerium lead titanate [(Ba _{1-X-y} Pb _X Ce _y)O·TiO ₂]		1 ⁻ 1	-		-	-	-	-	-	1392	1394	-	-	-	-	-	-
[(Ba _{1-X-y} Pb _X Ce _y)O·TiO ₂]	• •	ľ	-	294	-	-	-	-	-	-	-	-	-	-	-	-	-
[(Ba _{1-x} Ce _x)·O·TiO ₂] 4-II		4-11	-	-	-	-	-	1398	-	-	-	-	-	-	-	-	-
[{Ba _{1-X} Ce _X }O·(Ti _{1-X} Si _X)O ₂]. 4-II 1209	Barium cerium titanate [(Ba _{1-x} Ce _x)O·TiO ₂]	4-D	-	-	-	_	-	1396	-	-	_	-	-	-	-	-	_
Barium cerium titanate stannate [(Be _{1-x} Ce _x)O·(Ti _{1-y} Sn _y)O ₂]. 4-II 1354		4-11	-	_	_	-	_	1209	-	-	-	_	-	_	-	_	_
Barium cerium titanate zirconate [(Ba _{1-x} Ce _x)O·(Ti _{1-y} Zr _y)O ₂]. 4-II 1500	Barium cerium titanate stannate	4-11	_	_	_	_	_	1354	-	-	_	_	_	_	_	_	
Barium copper silicate (BaO·CuO·4 SiO ₂) 4-ii 1213 Barium crown glass 4-ii 1827	Barium cerium titanate zirconate		_	_	_	_	_		_	_	_	_	_	_	_	_	
Barium crown glass 4-II 1827	Barium copper silicate		_		_	_	_		_	_	_	1912		_			-
		1 1	_			_	_		1827						· [_	
		s i	_		_	-	_	_		_	_	1611	_		_	_	
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Material			Melting Point	itest of Fusion	uoji	r o	- 2	Specific Heat	à	^	Lincar	90		9	Thermal Transmittanco	Pressure
Name	2	2	20	<u>ح</u>	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	110 }	Thermal Conductivity	Thermal Diffusivity	Thermal L Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	1 E	4
	Volume	Density	를	#	Heat of Vapori	blin	\$ 50 E	70	The rmal Conducti	1	t ber	Thermal Absorpts	n itt	500	2 4	Vapor 1
	۲	ă	ž	_=_	žΣ	± 3	22	æ	Fő	E A	23	₹₹	FW	FE	FF	>
Barium fluoride (BaF ₂)	5	_	_	_	_	_	_	-	347	_	_	_		349	_	_
Barium lanthanum titanate			ì	_			_	_				_			ì	. 1
[(La _X Ba _{1-X})O·TiO ₂)]	4-11	-	-	-	-	-	1400	-	1402	-	-	-	-	-	-	-
Barium-lead intermetallics (Ba ₂ I'b)	6-I								642							i
' • '	4-11	-	-	-	-	-	1689	-		-	-	-	-	-	-	
	4-11	-	-	-	_	-	2000	-	-	_	1404	-		·•		
Barium magnesium silicates		- 1	-	_		•	-	-	-	-		-	_	_		
BaO · 3 MgO · SiC ₂	4-11	_	_	_	_	_			_	-	1215	_	_	_		_
Bao 4 Mg O 3.5 SiO2	1	_		-				_			1215	_		_	_	_
Barium magnesium aluminum	_ !					-						_				
silicate																
(3 BaO · 2 MgO · 8 Al ₂ O ₃ · 26 SiO ₂)	*-#	-	-	-	-	-	-	-	-	-	1217- 1221	-	-	-	-	-
Barium nitride (Ba ₂ N ₂)	5	_	621	-	-	_	_	_	_	_	_	_	-	_	-	_
Barium oxide (BaO)	4-1	-	-	-	-	-	49	51	53	-	-	_	-	_	-	-
Barium oxide + Strontium oxide .	4-1	-	-	_	-	_	-	-	641	_	-	- 1	-	-	-	-
Barium oxide + Strontium oxide +																
	6-11	-	-	-	-	-	-	-	911	-	-	-	_	-	-	-
Barium exide + Stroatium exide + + Zirumium (di-)exide	4-1	_	_	_	_	_			643	_	_		_	_	_	_
Barium phosphide (Ba ₂ P ₂)	5	_	ū35	_	_	_			-	_			_			_
Barium selenide (BaSe)	6-1	_	365	_	_	_	_		_	-			_			_
	4-11	_	_	_	-	_			_	1687			_	_	_	_
Barium silicide (BaSi ₂)	6-1	_	371	_	- 1			í _	_		373	_	_	_	_	_
Į.	6-I	-	_ !		_	_	_	_	531	_	۱ -	_	_	_	-	_
Barium strontium ferrites					1			l				1				1 1
4 1-4	4-11	1067	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-11	-	-	-	-	-	-	-	-	-	1406	-	-	- 1	-	-
,	5	649	649	-	-	-	-	651	-	-	-	-	-	-	-	-
	6-1	-	636	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium titanates	l					ļ								İ		
BaO·TiO ₂	4-11	-	1376	-	-	-	1378- 1380	1382	1384	1396	1388	-	-	-	-	-
BeO·3 TiO ₂	4-77	_	_	_	-	_	_	۱.	_	_	1388	۱ ـ	_	_	_	_
1	4-11	_	_	-	j -	١.	-	-	-	_	1388	-	-	-	_	_
BaO · 5 TlO ₂	4-11	-	-	-	-	! -	-	-	-	-	1388	-	-	-	_	_
BaO-6 TiO ₂	4-II	-	-	-	-	-	-	-	-	_	1388	-	i -	-	_ '	-
BaO · 18 TiO ₂	4-11	-	-	-	-	-	-	-	-	-	1388	-	-	-	- 1	-
2 BaO-TiO ₂	4-II	-	1376	-	-	-	-	1382	-	-	-	-	-	-	-	-
Barium titanate costing on niobtum-zirconium alloy	6- <u>i</u> 1	-	-	-	-	-	_	_	-	-	_	_	1369	-	-	_
Barium titavate + Calcium titavate	4-11	-	1579	_	-] -	-	-	_	-	_	-	-	-	_	-
Barium titanate + Lead titanate .	4-11	i -	-	-	-	-	-	1581	-	-	-	-] -	-	-	-
Burium titanate + Manganese	l	1	1	j 1		1		l			1	1]	1		1
niobate	4-11	-	-	-	-	-	-	-	1583	-	-	-	-	-	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Registivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Barium titanate + Strontium titanate Barium titanium germanium	4-11	-	-	-	-	-	-	1585	-	-	-	-	-	-	-	-
oxide (BaO·TiO ₂ ·3 GeO ₂)	4-11	-	-	_	-	_	_	_	ĺ		1127		_			
Barium titanium ailicate giass	4-11	-	-	-	_	-	_	! -	[-	1691	_		-	-	-
Barium uranate (BaO·UO ₂)	37	-	1482	-	-	-	_	1454	_			_	-	-	-] [
Barium zirconate (BaC·ZrO ₂) .	4-11	-	-	-	-	-	-	1496	_		1498	-	-	_		-
Beetle	6-11	-	-	-	-	-	-	-	-	_	1002	-	-	-	<u> </u>	١.
Beryl	4-II	-	-	-	-	-	-	-	1225	_	1227	-	-	_	-	۱.
Beryllia	4- <u>1</u>	5 5	55	55	55	-	57	59	63	65	67	71	73- 77	79- 81	33	85
Beryllium (Be)	1	48	48	48	48	48	50	53	55	57	59	_	61	63	_	65
Beryllium QM-V	1	-	-	-	-	-	51	-	-	_		_	-	_	_	_
Beryllium + EX;	2-11	841	-	-	-	-	-	843	845	~	847	_	- 1	_	_	
Beryllium ÷ Aluminum	2-1	38	-	-	-	-	-	-	40	42	-	-	44	_	_	
Beryllium + Aluminum + $\sum X_i$.	2-11	-	-	-	-	-	-	-	-	-	833	-	-	-	_	_
Beryllium + Beryllium oxide cormet	6-1I	751	-	-	-	751	-	753	757	_	762	-	_	_	_	764-
Beryllium + Magnesium + $\Sigma X_{!}$.	2-11	835	-		_		837		220	l			- 1	ı		766
Beryllium aluminate (BeO·Al ₂ O ₂)		_	_	_		-		979	839	-	-	-	-	-	-	-
Beryltium aluminonilicate (3 BeO·Al ₁ O ₂ ·6 SiO ₂)	4-U	_	-	_	_	-	-		1225	-	981	-	-	-	-	-
Beryllium borides		ı				-	ı	-	****	-	1221	-	-	-	-	-
BeB	6-I	295	-	_	_	_		l	ļ	ſ		- 1	ı	ĺ		
BeB ₂	6-1	-	296	-	_	_	_ !	-	-	-	-	-	-	-	-	-
BeB ₄	6-I	-	296	-	_	_		-	-	-	-	-	-	-	-	-
BeB _g	6-I	295	296	-	-	_	_	-	-	-	-	-	-	-	-	-
ВеВ,	6-1	-	296	-	-	.	_			-	-	_		-	-	-
Be ₂ B	6-1	295	296	-	-	- 1	- 1		_	-	-		_] [-
Be _j B	6-1	-	296	-	-	_	-		_	-	- 1	_	_	_	_	-
Beryllium indium sclenide (InBeSe ₃)		I			I	I	I	_		-	-			-	-	-
, , , , , , , , , , , , , , , , , , , ,	6-1	15	-	-	-	-	-	- !	329	-	-	-	-	-	-	-
307,333,030,000	5	-5	12	15	12	-	-	17	-	-	19	-	-	-	-	21
-	6-11	_	_	-	-	-	-	303	305	-	- [-	-	-	-	-
•	6-II	_ !	_		-	-	-	-	757	- [-	-	-	-	-	-
	6-11	_	_	_	_	-	-		75?	-	-	-	-	-	-	-
· · · · · · · · · · · · · · · · · · ·	6-11	_	_	_	-	_	-	-	757	- j	-	-	-	-	-	- [
1	6-11	-	_	_			-	-	757 757	-	-	-	-	-	-	-
3	6-11	-	-	_	_	_	-	-	31	-	-	-	-	-	-	-
	6-11	_	-	_	- 1		-	:53	757	-	-	-	-	-	-	-
	6-11	-	_	_	_	_	-		131	-]	762 762	.	-	-	-	-
	6-11	.	-	_	_	-	-	753	-	-	762 762	-	-	-	-	-
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Material Name	Volume	Denaity	Melting Point	Heat of Fusion	licat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thormal Cenductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmitta.ce	Vapor Pressure
Beryllium chromite				! !]									
(BeO·Cr ₂ O ₂)	4-2	-	-	-	-	-	-	-	-	-	1049	_	-	-	-	_
Beryllium fluoride (BeF ₂)	5	351	351	351	351	351	-	-	-	-	l - i	-	-	! .	_	353
Beryllium nurides	1				l			l							1	l
Be ₃ N ₂	5	-	495	495	495	-	-	-	497	-	-	-	-	-	-	-
Be ₃ N ₄ Beryllium oxides	5	-	495	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium ozide (BeO)	4-1	55	55	55	55	_	57	59	61	65	67	71	73-	79-	83	85
BD-98	4-1	_	_	_	_	_		İ	61				77	81	ĺ	
UOX grade	4-1	_	-	-	_	l	- -	_	61	65	-	-	77	-	-	-
Beryllium oxide + Aluminum						_	-	-	**	-	-	-	-	-	-	-
oxide + Magnesium oxide Beryllium oxide + Alaminum oxide + Thorium (di-)oxide	4-1	-	-	-	-	-	-	-	-	-	645	-	-	-	-	-
Beryllium oxide + Aluminum oxide + Thorium (di-)oxide +	4-I	-	-	-	-	-	-	-	647	-	649	-	-	-	-	-
+ Magnesium oxide	4-1	-	-	-	-	-	-	-	651	-	-	-	-	-	-	-
oxide + Zirconium (di-)oxide .	4-1	-	-	- [-	-	-	-	653	-	-	-	_	_	-	_
Beryllium oxide + Aluminum oxide + Zirconium (di-)oxide + + Magnesium oxide	4-1	_	_	_		_	_	_	655							
Beryllium oxide + Beryllium cermet	6-11			_	_	751		755		- 1		-	-	-	-	-
Beryllium oxide + Beryllium + +Molybdenum cermet.	6-11	_	-	-	-	-	-	768	760 770		762	-	-	-	-	-
Beryllium oxide + Beryllium + + Silicon cermet	6-11	-	-	_	-	-	-	_	774	_	776	_				-
Beryllium oxide + Magnesium oxide + Aluminum oxide	4- <u>1</u>	-	-	-	-	-	_	-	657	_	_	_	_	_	_	
Beryllium oxide + Magnesium oxide + Aluminum oxide + + Thorium (di-)oxide	4-1	_	-	_	_	_	_		659							
Beryllium oxide + Magnesium oxide + Aluminum oxide ·· + Zirconium (di-)oxide	4-1															
Beryllium oxide + Magnesium oxide + Zirconium (dialoxide +	3-1			-		-	-	-	661	-	-	-	-	-	-	-
+ Aluminum oxide	4-1	-	-	-	-	-	-	-	663	-	-	-	-	-	-	-
Beryllium oxide + Molybdenum beryllide	6-11	-	-	-	-	-	-	778	-	-	-	-	-	-	-	-
Beryllium oxide + Niobium cermet	5 6-II	700	-	-	-	-	-	759	-	-	-	-	-	-	-	-
Beryllium oxide + Niobium beryllide	5	780	-	-	-	-	-	-	-	-	782	-	-	-	-	-
Beryllium oxide + Tanatlum beryllide	5				-	-	-	761	-	-	-	-	-	-	-	-
•		_	-	-	-	-	-	763	-	-	-	-	-	-	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of	Heat of	Sublimation	Resistivity	Specific Heat	Thermal	Thermal	Diffusivity Thermal Linear	Expansion	Thermal Abscrptance	Thermal Emittance	Thermal Reflectance	Thermal	Vapor Pressure
Beryllium oxide + Thorium (di-)oxide + Aluminum oxide . Beryllium oxide + Titanium	4-1	-	-	-	1-	-	-	-		-	-	66	T	-	- W	FÆ	FF	3
beryllide Beryllium oxide + Uranium	5	-	-	-	-	-	-	.	765	-	-	-		-	-		_	
(di-)oxide Berylliam oxide + Zirconium beryllide		-	-	-	-	-	-		-	567	-	-		-	-	-	-	-
Beryllium oxide + Zirconium (di-) oxide + Magnesium oxide + + Aluminum oxide		-	-	-	-	- 	-		767	-	-	-		-	-	-	-	-
Beryllum oxide porcelain type 4811	4-I 5	1003	-	-	-	-	-	1	-	669	"	-		-	-	-	-	-
Berylli im silicate (2 BeO · SiO ₂).	4-11		1	-	-	-	-		-	1017	-	122		-	-	-	-	-
Beryllium sulfide (BeS) Beryllium titanates	5	653	653	-	-	-	-		-	-	-	-	1	-	-	-	_	655
BeO·TiO ₂	4-11	-	-	-	-	_		1.	.	-	_	140				1		
2 BeO: TiO ₂	4-II	-	-	-	-	-	-		- 1	-] -	140	1 1	- 1	_	-	-	-
4 BeO · TiO ₂	4-11	-	-	-	-	-	-	.	-	-	-	140	1	ı	<u> </u>	-	-	-
6 BeO·TiO ₂ Bismuth-cerium intermetallics	4-II	-	-	-	-	-	-	-	-	-	_	140	1	.	_		_	i -
BiCe Bice									- 1					ı	- 1		-	-
Pic-	6-1	-	683	-	-	-	-	-	.	-	-	-	-	.	- 1	_	_	_
51.0	6-1 6-1	-	683	-	-	-	-	-	.	-	-	-	-	.	-	-	_	_
Bismuth sclenide tellurides (Bi ₂ Te _{2-x} Se _x)	6-1	-	693	•	-	-	-	-		-	-	-	-		-	-	-	-
Hismuth stannate (Bi ₂ O ₃ ·3 SnO ₂)	4-11		1	_	-	-	564	-		566	-	-	-	.	-	-	-	-
Bismuth telluride(Bi ₂ Te ₂)	6-1	553	553	.	_	_	555	١.	- 1	1357					- 1		- 1	
Bismuth telluride + Bismuth selenide	6-I	-	_		_	_	711		57	559	561	-	-	-	•	-	-	-
Bismuth tellurium sulfide (Bi ₂ To ₂ S)	5	_	_		_			-		713	-	-	-	-	٠	-	-	-
Boral clad with boron carbide	5	979	_		Ī	-	657	-		659	-	-	-	-	.	-	-	-
Borate glasses	4-11	1605	-	-	_	_	1607	98	"	-	- 1	-	-	-	.	-	-	-
Borolites		- 1	1					-			-	1609- 1633	-	-		-	-	-
Borolite	6-11	842	_			- 1										1		J
	6-11	-	-	-	-	-	-	-		-	-	-	-	-	.	- .	-	- 1
	6-11	_	_		-	-	-	84	6	-	-	-	-	-	-	- .	-	- 1
	6-II	-	_	<u> </u>	[]	-	844	-		-	-	850	-	-	-	. .	-	-
	6-II	913	- 1	_	_	_	844	84	٠ ١	-	-	-	-	-	-	• •	-	-
Boron (B)	.	67	67	-	67	67	69	7	. `	-	-	-	-	-	-	· -	-	-
Boron coating on molybdenum .	5-II	-	-	- [-	-"	-03		۱ ٔ	-	-	-	-	-	-	· -	.	73
	-II	-	_	_	_	_		_		_	-	-	-	128		-	· j	-
Soron + XX ₁ 2	-11	849	-	-	-	-	_	-				-	-	29	-	-	.	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	lient of Vaporization	Heat of Sublimation.	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thernal Emittance	Thermal Reflectanco	Thormal Transmittance	Vapor Preseure
Boron + Iron	2- <u>i</u>	-	_	-	-	46	_	-	_	_	_	_	-	-	_	48
Boron + Silicon	2-I	-	-	-	-	-	50		- 1	- 1	-	-	-	-	-	-
Boron aluminate (2 B ₂ O ₃ · 9 Al ₂ O ₃)	4-11	-	-	-	-	-	-	-	-	- 1	963	-	-	-	-	-
Boron carbide (B ₆ C)	5	25	23	-	-	-	-	27	29	.31	33	-	35	-	-	37
Borun carbide clad with alumi- num	5	979	-	_	-	-	-	961	-	-	-	-	-	-	-	-
Boron carbide coating on Inconel X	6-11	-	-	-	-	-	-	-	-	-	-	-	1403	1405	-	-
Boron carbide + Iron cermet	€-11	928	-	-	-	-	-	-	- 1	-	-	-	-	-	- 1	-
Boron oxide (B ₂ O ₃)	4-1	-	-	-	-	-	-	87	-	-	-	-	-	-	-	20
Boron oxide glass	4-11	-	-	-	-	-	-	1635	-		-	-	-	-	-	-
Boron nitride (BN)	5	499	499	-	499	-	501	503	565	-	507	-	509- 513	515	-	-
Boron nikride + Boron oxide	5	-	-	-	-	-	832	834	836	-	838	-	-	-	-	-
Boron nitride + Graphite	5	-	-	-	-	-	-	828	830	-	- i	-	-	-	-	-
Boron phosphide (BP)	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron silicides																
B _e Si	6-J	-	~	-	-	-	-	-	-	-	-	-	375- 377	379	-	-
B _g Si	6-1	-	-	-	-	-	-	-	-	-	-	-	375- 377	379	-	-
Borosilicate giass	4-II	1693	1693	-	-	-	1695	1697	1699	1701	1703	-	1705- 1707	1709	1711- 1713	-
Brass	2-1	-	-	-	-	-	170	172	-	174	-	-	178- 190	182	-	-
	2-11								1000							
Brass, aluminum	2-11	-	-	-	-	-	-	-	-	-	1004	-	-	-	-	-
Brass, free cutting leaded	2-1	168	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brass, red	2-II	-	-	-	-	-	-	-	-	-	1002	-	-	-	-	-
Brass, yellow	2-I	-	-	-	-	-	-	-	-	174	-	-	176	-	-	-
	2-II								1000						1	
Brazing alky]]
GE-62	2-II	-	-	-	-	-	-	-	-	-	1168	-	-	-	-	-
GEH62-V	2-II	-	-	-	-	-	-	1130	-	-	-	-	-	-	-	-
•	2-11	-	-	-	-	-	-	-	-	-	1378	-	-	-	-	-
Bricks														1		
	5	-	-	-	-	-	1029	-	1(31-	-	1935- 1937	-	1039- 1043	-	-	-
	5	-	-	-	-	- :	1629	-	-	-	-	-	1039	^	-	-
Chromomagnesite	4-1	-	-	-	-	-	-	-	741	-	-	-	-	-	-	-
ForsterRe	5	^	-	-	-	-	1029	-	1033	-	-	-	-	-	-	-
K-30 insulating	5	-	-	-	-	-	-	-	-	-	1035	-	-	-	-	-
Magnesia	5	-	-	-	-	-	1029	-	-	-	-	-	-	-	-	-
Magnesite	4-I	-		-	-	-	-	-	743	733. 737	-	-	-	-	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	liest of Vaporization	lient of Sublimation	Electrical Registivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Ruflectance	Thermal Transmittance	Vapor Pressure
Bricks (cost.)																
Magnesite-chrome	5	-	-	-	-	-	1029	-	- 1	-	-	-	-	-	-	-
Magnesite "he"	5	-	-	-	-	-	-	-	1033	-	-	-	-	-	-	-
Mica	5	-	-	-	-	-	-	-	999	-	-	-	-	-	-	-
Mica, white	5	-	-	-	-	-	-	-	353	-	-	-	-	-	-	-
Süica	4-)	-	~	-	-	-	-	-	516	363, 795, 816	-	-		-	-	-
	5	-	-	-	-	-	-	-	-	-	1037	-	1941	-	-	-
Silicon carbide	5	-	-	-	-	-	-	-	125	-	-	-	-	-	-	-
Sillimanite	4-3	-	-	-	-	-	-	-	615	-	-	-	-	-	-	-
Vermicultle inpulating	5	-	-	-	-	-	-	-	959	-	-	-	-	-	-	-
Bromyrke	5	-	-	-	-	-	-	-	-	,	-	-	-	-	-	-
Bronze	2-I	154	-	-	-	-	156	-	-	-	-	-	162	-	-	-
	2-11	~	-	-	-	-	-	-	-	-	398	-	-	-	-	-
Bronze, aluminum	2-II 2-II	-	-	-	-	-	-	-	-	-	950	952	954- 555	360	-	-
Broaze, lead	1 1	-	-	-	-	-	-	-	-	-	976	-	1	-		
Bronze, phoenic	2-11	-	-	-	- -	_	-	-] [-	965	-	-		_	
Broaze, silicoa	2-11							_	<u> </u>	1	994	1			_	
Broaze, tellurium-aluminum	2-11	-	-	-	-	-	-	1		-	950	-	-	_		-
Broaze, Tin-Zinc	2-11	-	-	-	-	-	-	-	j -	-	995	-	-	_	-	-
Boras	6-II	-	-	-	-	-	-	-	-	1066	-	-	-	_		-
Butadiene-acrylonitrile copolymer	6-11	-	-	-	_	- 1	_	1054	-	1060	- 1	-	- 1	-	-	-
Butyl GR-1	6-11	-	-	-	-	-	-	-	-	1962	-	-	-	-	-	-
c	e 11	-	_	-		_	1	-	559	-			_	_	_	
CA-2, carbide tool steel	6-II	_	<u>-</u>	_	-	_	-	-	559			<u> </u>	_]	_	
CA-4, carbide tool steel	1		[_	i -		-		559	-	į 🔣	<u> </u>	- 75	l -		
Cadmium (Cd)	2-1	-	52	\$:		_			-	<u>-</u>	-	_	-	54	_	_
Cadmium Fact silicate glass	4-II	۱.		-	_		1731		_	۱.	_		_	-	i .	_
Cadmium oxides					1				i	1						
1	4-1	91	91	-	-	91	-	93		l -	_	-	_	-		57
Cd ₂ O ₃	4-1	-	_	-	-	[]	-	-	_	-	95	-	_	-	-	-
Cadmium sulfide (CdS)			_	-	-	-	661	663	-	-	-	-	965	-	_	! - !
Cadrium telluride (CdTe)	1	-	-	۱ ـ ۱	-	_	568	570	-	-	-	-	-	-	<u> </u>	-
Calcia	4-1	99	59	-	-	-	101	103	105	-	107	-	-	-	-	199
Calcium (Ca)	1	-	77	77	-	-	73	-	-	-	-	-	-	-	-	51
Calcium + Magnesium	1	-	56	-		-	58	-	-	-	-	-	-	-	-	-
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Materiai Name	Volume	Denaity	Melting Point	Heat of Punion	Heat of	liest of	Kleytrical	Specific Items	Thermal	Thermal	Thermal Linear	Thernal	Thermal	Thernal	Thermal	Vauo: Pressure	
Calcium aluminates				T		1	+	 	+	+	+-			╀╌	 	+-	\dashv
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0.0 0.00	4-II 4-II	i	1:	-	-	-	-	957	-	-	-	-	-	-	-	-	ı
CHO-EALC	4-E	993	923	I	-	<u> </u>	-	557	1 -	-	-	-	Í -	-	-	-	i
3 CaO-ALO	V-11 4-11		-	-	-	-	-	-	-	-	591	-	-	-	-	-	ı
3 CaO - 5 ALO	4-E	_			-	-	-	257	-	-	-	-	-	-	-	-	1
12 CaO-7 ALO	4-2	_		i -	[-	-	-	-	553	-	-	-	-	i -	ı
Calcium aleminate + Malabdesson	-		l			-	i -	357	-	-	- 1	-	-	-	-	-	i
distilicide cermet	6-II	-	-	-	-	ļ -	-	-	-	-	754	-	_	۱.	l _	١.	ı
Calcium aluminum silicates			1		i	1	1	l	i	į					ĺ		1
C=0-ALO ₃ -2 SiO ₂	4-22	-	-	-	-	-	-	1233	-	-	1235	-	-	-	l -	۱.	ı
2 CaO-Al ₂ O ₃ -SiO ₂		-	-	-	-	-	-	1223	-	-	1235	-	_	-	-	-	ı
2 CaO-2 Al ₂ O ₃ -5 SiO ₂ -7 B ₂ O Calcium barium cerium titumite	4-2	-	-	-	-	-	-	1233	-	-	-	-	_	_	-	_	ı
	4-E	_	۱.	_	_	١.	İ	l	!		li				ĺ	1	ı
Calcium borates	_					-	14000	_	-	-	- 1	-]	-	-	-	-	1
CaO-B ₂ O ₂	4-E	_	1437	1437		l _	_	1439	į	İ	l i					l	i
	4-21	_	1637	1837	! _	l -	-	1439	-	-	-	-	-	-	-	-	ı
	4-E		1837	1437	_			1439	_	-	-	-	-	-	-	-	ı
20.80	÷≖Ì	-	1637	1237	_	_	_	186	_			-	-	-	-	-	ı
Calcium bersie glass	4-E	-	_	-	_	_	_	-				-	-	-	-	-	İ
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Calcium exchensis (CaCO)	1-2	-	-	-	-	-	-	-			_	_ [_		-	-	
Calcium copper allicate (CaO-CuO-4 SiO ₂).		1								_	-	_	-	1345	-	-	ı
(CaO-CuO-4 SiO ₂)	-4	-	-	-	-	-	-	-	-	-	1235	-	-	_	-	_	ı
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2 CaO-Fe ₂ O ₃			-	-	-	-	-	1060	-	-	-	-	-	-	-	-	ı
Colcium flucride (CaFy)	- 1	355	355	-	- 1	-	-	1969	-	-	- !	-	-	-	-	-	
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Calcium-lead intermetallics (Capit)	1	_ 1	-	ļ	1	į	Ì	i	- 1	1				_	-	-	
Calcium lend silicate gines.	-	- 1	-	- Î	-	-	-	-	596	-	-	-	-	-	- 1	_	ı
Calcium magnesicm silicates	-	-	- 1	-	-	- [1733	-	- [-	-	-	-	-	- [_	i i
CuO-MgO-2503	_	_]	_ !	_ i		ĺ	I		I			- 1	1				ı
2 CaO - MgO - 2 SiO		_			Ī	-	-	1236	- 1	- 1	-	-	- [- إ	-	-	
3 CaO-MgO-2 SiO ₂		_ İ	_		_ [_ 1	-	1239	-	- 1	-	-	-	-	-	-	
2 CaO - 5 MgO - 8 SIO ₂ - 2 B ₂ O - 4	-	-	-	_	- 1		įi	1229	<u> </u>	- 1	-	-	-	-	-	-	
Calcius molybdate (CaO-MoO) 4	_	_	-	_ 1		_		1239	- إ	-	- j	-	-	-	-	-	
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Ca _p V ₂		- 1	61	_			_		- 1	-]	-	-	-	-	-	-	
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Material Name	Volume	Penetit	n n	MILO STREET	Heat of Fusion	Heat of Vaporization	Heat of	Sub::lation	Resistivity	Specific Hent	Thermal Conductivity	Thermal Diffusivity	Thermal Linear	Thermal	Thermal	mittance	Reflectance	Thermal Transmittance	
Calcium oxide (CaO). Calcium oxide + Titanium (di-) oxide	4-1		9 1	39	-	-	-	T^-	01	103	105	-	107	-	-	7) E	-	-	10
Calcium selenides (CaSe)	4-I 6-I	-	36	_	-	-	-		-	-	-	-	671	-	-		-	-	-
CaO·SiO ₂	4-II 4-II	-	-		-	-	-	.	. ,	229	_	-	1231					-	•
3 CAO · SiO ₂	4-11	-	:			-	-	-	- 1	229	-	-	1231	_	[-	-
Calcium silicate glass	4-11	-	-	.		-	-	-	1	229	-	-	-	-	-	-	.	_	•
Calcium silicides CESi							-	~		-	-	-	-	-	-	-	11	729	-
CeSi.	6-1	-	523	-	.	-	-	۱.		_	_								
Casi	6-I 6-I	••	523			-	-			-	-	_	- 1	-	-	-		-	-
Calcium stannate (CaO·SnO ₂) Calcium strontium bertium account	4-11	-	523	-		-	-	<u>-</u> -	1	- -	359	-	-	-	-	-		-	- -
titanate $[(Ba_{1-K-y-z}Ca_xSr_yCe_z)O \cdot TiO_y]$. Calcium titanates	4-II	-	-	_		.	_	142							-	-	'		-
CaO. TIO			1		-			1764	٠ ١	.	-	-	-	-	-	-	-	.	-
3 (20) 2 770	Į	1410	1410	-	-		-	1412	14	14 14	16	_	1418	- 1			-		
alcium titanale coating on	-11	-	·	-	-		-	-	14		-	- 1	1418	-	-	-	-		-
alcium tungstate (CaO-WO ₃)	-11	-	-	-	i -		-	-	-	.	.	-	-	_	1371	_			
alcium uranate (CaO·UO ₁)	-11	_	1482	-		- 1	-	-	147	72 -		-	-	- 1	-	-		'	-
alcium vanadates			7405		-	.	-	-	148	6 -	İ	-	-	-	-	_			_
CaO·V ₂ O ₅	-11	-	-	_	١.	Ι.		-	l					- 1	- 1				-
2 CaO · V ₂ O ₅	-п	-	-	-	-	.	.	-	148	- I	- 1	٠	-	-	-	-	-	-	
3 CaO·V ₂ O ₅	-п	-	-	-	-	-	.	_	148	· 1	.	ł	-	-	-	-	-	-	
alcium zirconste (CaO·ZrO ₂) . 4-arbide tool steels	_ [_	502	1502	-	-	-		_	150	-		- 1		-	-	-	i -	-	
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rboloy 55A	n e	87	-	-				-	-	-	-	-	· -	. .	-	-	_	_	-
rions Carbon (C)		83	_					-	-	-	-	-	-	· ·	-	-	-	-	
Amorphous				-	-	8	3	85	-	87	' -	-	-		91- 93	95	-	-	1
GA grade	.		-	-	-	-	ı	83	-	87	-	-	-	Ι.		_			
Pyrolytic 1		63		_	-	-	-	٠	-	-	-	-	-		91	95	-	-	
bon coating on molybdenum . 6-11	1		_		-	-	-	.	-	89	-	-	-	-		-	-	-	
bon electrode	-		-	_	_	-	-	85	-		-	-	129	3 12	95 .	-	-		
bon impregnated graphite 1	-		-	-	_	_	'	03	-	87	-	-	-	-	.	.	-	_	
bon-phenolic laminate K-4926					i		-		-	358	-	-	-	-	.	.	-	-	
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Material Name	Volume	Denoity	Melting Point	Heat of Fusion	Hoat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Carbon steels	3	-	-	1	•	3	5, 312	7- 10	ı	12- 14	16- 20	•	-	1	•	22
Carbonyl nickel	1	- 1	694	-	-	-	-	-	_	_	-	_	_	-	-	-
Cast iron	3	27	-	-	-	-	-	-	29- 37, 4 37	-	39- 41, 444	-	-	-	-	-
Cast iron, gray (see grey cast iron)																
Cast iron, nodular (see Nodular cast iron)																
Castolite	6-11	974	-	-	-	-	-	-	976	1082	976	-	-	-	-	-
Catalin	6-II	-	-	-	-	-	-	-	-	-	986	-	-	-	- 1	-
Cellulose acotates	6-11	^	-	~	-	-	-	-	-	-	941	-	-	-	-	-
Cellulose acetate, expanded	6-11	-	-	-	-	-	-	-	939	-	-	-	-	-	-	-
•	6-II	-	- [-	-	-	-	-	-	-	946	-	-	-	-	-
Cellulose propionate	6-II	-	-	-	-	-	-	-	-	-	944	-	-	-	-	-
Cement-barytes aggregate	5	- 1	- 1	-	-	-	-	1023	1025	-	-	-	-	-	-	-
Ceramic laminate	6-II	-	-	-	-	-	-	-	-	-	1225	-	-	-	- :	-
Cercor	4-11		-	-	-	-	-	-	-	1591	-	-	-	-	-	-
Ceria	4-I	111	111	-	-	-	113	115	119	-	121	-	124- 128	-	-	-
Cerium (Ce)	1	402	402	402	402	402	404	406	-	-	-	-	- :		-	408
Cerium + ΣX_{i}	2-11	-	853	-	-	-	-	-	-	-	-	-		-	-	-
Cerium + Neodymium	2-1	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-
Cerium + Silicon + ΣX_i	2-11	-	851	-	-	-] -	-	-	-	-	-	-	-	-	-
Cerium aluminate (2CeO · 3Al ₂ O ₃)	4-11	-	-	-	-	-	-	-	-	-	993	-	-	-	-] -
Cerium aluminides		-								1					1	1
CeAl	6-1	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
CeAl ₂	6-1	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
CeAl ₄	6-1	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce ₂ Al ₂	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium aluminum silicides (Ce ₂ Al ₃ Si ₂)	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
'''	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium borides	أيا				1	ļ		l	İ	1	1			1	1	
CeB ₄	6-1	296	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CeB ₆	6-1	295, 296	296	-	-	-	300	-	-	-	302	-	-	-	-	-
Cerium (tri-)b omide (CeB43).	5	11	-	-	-	-	! -	-	-	-	-	-	-	-	-	-
Cerium-cadmium intermetallics									1	1			ĺ			
CeCd	6-I	662	-	-	•	-	-	-	-	-	j -	-	-	-	-	-
CeCd ₂	6-1	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CeCd ₃	6-1	662	-	-	-		-	-	-	-	-	ì -	-	-	-	-
CeCd _{ii}	6-1	662		-) _		I -	1 -	l _	I _	1 -	1 _	I _	1	1	! _

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Cerium carbides																
CeC ₁	5	294	- i	-	-	-	-	-	-	-	-	-	-	-	-	-
Cə ₂ C ₃	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium (tri-)chloride (CeCl ₂) .	5	339	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-cobal: intermetallics																
	6-1	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-copper intermetallics		ļ														
	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
CeCu ₂	6-1	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
CeCu ₄	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
CeCu _g	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	363	363	-	-	-	-	365	- ;	-	-	-	-	-	-	-
Cerium-gallium intermetallics (CeGs ₂)	6-1	662	_	-	-	_	_	-	-	-	_	-	-	_	-	-
Cerium-gold intermetallics																
CeAu	6-1	-	662	-	-	-	-	-	-	-	_	-	_	-	-	-
CeAu ₂	6-I	-	662	_	-	-	-	-	_	-	-	-	-	-	-	-
CeAu ₃	6-I	-	662	-	-	-	-	-	_	-	-	-	_	-	-	-
Ce ₇ Au	6-1	-	662	-	-	-	_	-	-	-	-	-	-	-	-	-
Cerium hydride (Cell ₂)	5	457	-	-	-	-	-	-	i -	-	-	-	-	-	-	-
Cerium-indiam intermetallics (CeIn ₂)	6-I	662	_	_	_	_	_	_	_	_	_	_	_	_	_	_
1	5	_	477	_	_	_	_	_	_	_	_	_	_	_	_	-
Cerium-lead intermetallics										ļ	ŀ					
	6-1	662	663	_	_	_	_	_	_	_	_		_	_	_	_
Ce₂Po	6-1	-	663	_	_	-	_	_	_	۱ ـ	_	_	_	_	_	_
Cerium-magnesium intermetallics									ì	ļ						
CeMg	6-1	662	663	_	_]_,	-	-	-	-	-	_	_	_	-	_
CeMg ₃	6-1	-	663	-	-	-	-		-	-	_	-	_	-	-	-
CeMg,	6-I	-	663	-	-	-	-	-	-	-	-	-	-	-	! 	-
	6-1	-	663	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerium-mercury intermetallics (Ceilg)	6-I	662	_	_	_	_	_	_	_	_						
Cerium-nickel intermetallics	"	002					-	-	-	-	-	-	-	-	-	-
	6-1	662	_	_	_	_	_	_	_	_	_	_	_		_	
•	6-1	662		_	_	-	-	_	_	_	_	-	_	-	_	
	6-I	662	-	_	_			_			- _		_	_	-	_
	6-1	662		_	_	_		-		_	_	_	_	_	_	_
- 41	5	621	_	_	_	_		Ţ	_		_	_	_	_	_	_
Cerium-osmium intermetallics		~~~														_
	6-I	662	-	-	-	-	-	-	-	-	-	-	-	-	-	~

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of	Electrical	Resistivity	Specific Heat	The rmal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Therma!	Thermal Emittance	Thermal Reflectance	Thermal	Vapor Pressure
Cerium oxides							+	+			-	H	44	FE	FE	FF	5
CeO	4-1	111	-	۱.	_	_	1		- 1					l		1	
CeO ₂	4-I	111	111	-	-	-	12		115	119	-	- 121	-	-	-	-	-
Ce ₂ O ₃	4-1	111	۱.	۱.	İ	ļ	1		- 1			121	-	124- 128	j -	-	-
Cerium (di-)oxide + Magnesium oxide	4-3	_		_	-	-	-	1	117	-	-	-	-	-	-	-	-
Cerium (di-)oxide + Uranium		i	-	-	-	-	-		-	673	-	-	-	-	-	_	_
Cerium phoenkida in a	4-1	375	-	-	-	-	-	Ι.	- 1	677	.				- 1		
Cerium-platinum intermetallics	5	635	-	-	-	-	-		-	-	-	-	-	-	-	-	-
Cerium sclenides	5-1	662	-	-	-	-	-	Ι.	.	_	_			l			- 1
CeSe	-1	365	_		l			ļ			-	-	-	-	-	-	-
Ce ₉ Se ₄	-1	365	.	-	-	-	-	-	.	-	-	-	-	.	-	_	- 1
Cerium silicide (CeSi ₂) 6	-1	523	523	-	-	-	-	-		-	-	-	-	-	-	-	-
Cerium-silver intermetallics			524		- [-	-		-	-	-	-	-	-	-	-
CeAg 6.	4	662	662	_		- 1		1	-				- 1	- 1		- 1	- 1
CeAg ₂ 6-	_		662	-	•	-	-	-	-	-	-	-	-	-	_	_	
CeAg ₃ 6-	4 .		662	- 1	-	-	-	-	-	-	-	- .	-	- 1	_	-	-
Cerium stannides				-	-	-	-	-	-	-	-	- .	- 1.	-	-	-	-
CeSn ₃ 6-	. 1	- ,	541	-	_	- 1			1	- 1	I	- 1		- 1		·	-
Ce ₂ Sn · · · · · · 6-	ı .	- 1	541	-	-	-	-	-	-	.	- .	- -	- .	-	-	.	_
Ce ₂ Sa ₂ 6-7	. -		541	-]	_	- 1	-	-	٠	- .	- -	- -		-	.	-
Cerium sulfides		-			_	-	-	-	-	٠ ٠	- -	• -	- .	.	
CeS 5	6	67 6	67	-	_	_	670	•	1	ı							
CeS ₂ · · · · · 5	6	67 6	67	-	- .	į	-"	672	Ci	74 -	- 6	76 -	-	78
Ce ₂ S ₃ · · · · · · · 5	6	67 6	67	.	- .	- 1	_	-	1 -	. •	• -	· -	-	٠ .	. .	- 1	.
Ce ₃ S ₄ · · · · · · · 5	66	67 6	67 -	.	- -			672	67	4 -	. 6	76 -	-	- -	·	.] .	.
Cerium tellurides CeTe ₂		-			1	Į		-	-	-	٠ -	-	-	-	. -	6	78
Carro	63	6 -	-	.] .	- -	. .	.	_	١.		- [1				-
Cerium-thallium intermetallics	63	6 -	-	.	. -	. .	.	_			-	-	-	-	-	-	.
CeTi				1						-		-	-	-	-	-	
Certl.	-	66	- 1	-	-	-	.	-	_	_		!		-			1
Co-Ti	-	66		-	-	-	.	-		1.		-	-	-	-	-	
Cerium vanadate (Cc ₂ O ₃ ·V ₂ O ₅) . 4-II	-	66	3 -	-	-	-		-	_		1 -	1:	-	j -	-	-	1
Cermets (also see individual cermets)	-	-	-	-	-	-		-	-	-	149	1	-	-		-	
Aluminum-chromium-																	
Aluminum-nickel-tilanium	930		-	-	-	-	.	-	-	-	-	-	-	_		1_	
• • • • • 6-п	925	-	-	-	-	-	.	.	_	_	1	1				1	
1 1			1	1		1				1	-	-	-	-	-	-	

	T	-i-	T	Т	_	_		T	_					,					
Material Name	Volume	Density	Melting Point	lient of Fusion	Heat of	Vaporization	Heat of Sublimation	Electrical	Specific Heat	Thermal	Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal	Thermal	Thermal	ansmittance	Vapor Pressure
Cermein (also see individual cermets) (cont.)						1			+	+		20	HA	H-4	FE	F	F	+	<u>~</u>
Aluminum oxide + Aluminum	. 6- - 11	-	-	-	_		_	_		_		_							
Aluminum oxide + Chromium cermet	6-11	731	_	_	_		_	_					729	-	-	-	-	-	٠
Aluminum oxide + Chromium + Molytdenum cermet	+ 6-Ⅱ	مئذ	١.	-	_				-	91		-	733	-	735	-	-	-	·
Aluminum oxide + iron cermet		_	_				-	-	j -	-		-	739	-	-	-	-	-	
Aluminum oxide + Titanium (di-)oxide + Chromium + + Molybdenum cermet		-	_		-		-	-	-	-		-	741	-	-	-	-	-	
Aluminum oxide + Tungsten + + Chromium cermet	6-II	_	_					-	-	-		-	-	-	747	-	-	-	ı
Barium oxide + Stroatium oxide + Zirconium cermet.	6-11	_		_	-	İ	-	-	-	-		-	743	-	745	-	-	-	
Beryllium + Beryllium oxida cermet	6-11	751	_	-	-		-	-	-	\$11	١	-	-	-	-	-	-	-	
Beryllium oxide + Beryllium	0-11	131		-	-	3	751	-	753	757	· ·	-	762	-	-	-	-	76-	
	6-II	-	-	-	-	7	51	-	755	760		. ,	62	_		ļ		76	1
+ Molybdenum cermet	6-11	-	-	-	_	.	.	_	768	770	.		770		-	-	-	-	
Beryllium oxide + Beryllium + + Silicon cermet	6-П	-	-	-	_	١.	.	_	_	774				-	-	-	-	-	
	6-11	-	_	_	_	١.		_	778		-	1	76	-	-	-	-	-	
Beryllium oxide + Niobium cermet	6-21	780	_		_	_				-	-		-	-	-	-	-	_	
Boron carbide + Iron cermet. Calcium aluminate +	6-11	928	-	-	-	-			-	-	-	7	82 -		-	-	-	-	
+ Molybdenum (di-) zilicide	5-n	_													-	-	-	-	
Chromium-molybdenum-		925	_	-	-	-	-		-	-	-	7/	34 _	• •	-	-	-	-	
Chromium-silicon-titanium		25		1	-	-	-		-	-	-	-	-	-	-	-	-	-	
Chromium boride+Chromium- molybdenum intermetallic cermet			-	-	-	-	-		-	-	-	-	-	-	.	-	-	-	
Chromium silicide cermets . 6		13		-	-	-	-		-	-	-	-	-	-	. .	-	-	_	
Chromium-titanium inter- metallics + Copper cermets . 6	e II-	17	.	_			-		-	-	-	91	5 -	-	.	.	-	-	
Chromium-titanium inter- metallics + Molybdenum cermeta 6.		is .				-	-		- 	-	-	-	-	-	-	.	-	-	
Cobalt-chrorium alicys + + Titaniur (di-)boride cermet 6-		İ			-	-	-		-	-	-	-	-	-	-	1	-	-	
	-II 93	30 -			-	-	-	-		- 	•	-	-	-	-	-	-	-	

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublitaation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorpance	Thermal Emittance	Thermal Reflectance	Thermal Transmit/Mce	Vapor Pressure
Cermets (also see individual cermets) (cont.)																
Europium oxide + Iron- chromium alloy cermet	S-Π	-	-	-	-	-	-	-	-	-	786	-	-	-	-	-
Hafnium carbide + Zirconium cermet	6-11	-	-	-	-	-	-	-		-	852	-	-	_	-	-
Magnesium oxide ÷ Tungsien cermet	6 -1 1	-	-	-	-	_	-	-	_	_	788	_	_	-	_	_
1	6-11	923	-	-	-	-	-	-	-	-	_	_	_	_	_	_
Molybdenum-silicon-titanium cermet	f-11	930	-	-	-	-	-	-	-	_	-	-	_	-	-	-
Silicon carbide + Magnesium oxide + Nickel aluminide cermet	6-11		_	_	_	_										
Silicon carbide + Silicon	6-II				_	_	_	-	- 856	-	854	-	-	-	-	-
Silicon (di-)oxide + Aluminum cermet	6-II	_	-	-	_	-	_	-	-	-	750	-	-	-	-	-
Sodium fluoride + Beryllium ferride cermet	6-11	-	_	_	_	_	_		911			_		_	_	-
Strontium titanate + Cobalt cermet	6-JI	_	-	_	_	_	-	-	792	_		_		_	-	
	6-11	858	-	-	_	_	-	-	-	_	_	- I	_	_	-	
Tantalum carbide + Tungsten cermet	6-II	-	-	-	-	_	-	-	-	_	850	_	_	_	_	_
Thorium (di-)oxide + Tungsten cermet	6-П	-	-	_	_	_	-	_	-	_	-	_	_	_	_	794
Titanium carbide + Cobalt cermet	6-11	862	-	-	-	-	_	-	911	-	864	_	_	_	_	_
Titanium carbide + Molyb- denum + Tungsten cermet	6-11	-	-	-	-	-	-	-	-	-	866	_	-	-	, _	-
Titanium carbide + Nickel cermet	ε-11	868	-	-	-	-	-	871	873	-	875- 877	-	-	-	_	-
Titanium carbide + Niobium carbide + Nickel cermet	6-II	_	_	_	_			_	911		***					İ
Titanium carbide + l'ungsten	6-II	-	_	_	_	_	_		_		879	_	_	_	_	_
Titanium nitride +Chromium+ + Titanium cermet	II-9	-	_	_	_	_	_ {	_	_	_	909		_	_		
Titanium (mon-)oxide + + Chromium-titanium alloys cermet	6-II												_	-	-	-
Titanium tungsten (di-)car- bide + Cobalt cermet	Ì	_			-		-		-	-	796	-	-	-	-	-
Titanium tun- sten (di-)car-	υ- Π	_	_	_	_	_	-		-		881	-	_	-	-	-
Tungsten cart de + Chromium-	6-II	_		_	_			_			895					
												-	_	-	-	
<u> </u>																

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sub-limation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffueivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittanco	Vapor Pressure
Cermets (also see individual cermets) (cont.)																
Tungsten carbide + Cobalt cermet	6-II	-	-	-	-	-	-	-	889	-	8 9 7- 905	-	-	-	-	-
Tungsten carbide + Nickel cerinel	6-II	-	-	-	-	-	-	-	-	-	907	-	-	-	-	-
Urardum (mono-) carbide + + Molybdenum cermet	6-II	-	-	-	-	-	-	-	-	-	891	-	-	-	-	-
Uranium (mono-) carbide + + Uranium cermet	6-11	-	-	-	-	-	-	-	-	-	893	-	-	-	-	-
	6-11	-	-	-	-	-	798	-	800	-	802	-	-	-	-	-
•	6-11	-	-	-	-	-	804	-	896	-	608	-	-	-	-	-
Uranium 'di-)oxide + + Niobium cermet	5 -1 1	-	-	-	-	-	810	-	812	-	-	-	-	-	-	-
Uranium (di-)oxide + Stainless steel cermet	6-11	-	-	-	-	-	814	-	816	-	818	-	-	-	-	-
Uranium (di-)oxide + + Zirconium cermets	6-II	820	-	-	-	-	-	-	822	-	824	-	-	-	-	-
Zirconium (di-)boride cermet	6-II	842	-	-	-	~	844	846	848	-	850	-	-	-	-	-
Zirconium (di-)oxide + + Titanium cermet	6-II	-	-	-	-	-	-	826	828	830	832	-	-	-	-	-
Zirconium (di-)oxide + + Yttrium oxide + Zirconium cermet	6-II	-	-	-	_	-	-	_	834	-	-	-	-	-	-	-
Zirconium (di-)oxide + + Zirconium cermet	C-II	-	-	-	-	-	-	-	-	836	838	-	-	-	-	840
Cesium chloride (CeCl)	5	-	-	-	-	-	-	315	-	-	-	-	-	-	-	-
Chemaco 342	6-II	-	-	-	-	-	-	-	-	-	948	-	-	- :	-	-
Chemaco 343	6-11	-	-	-	-	-	-	-	-	-	948	-	-	- 1	-	-
Chemaco 344	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco 345	6-II	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco 346	6 -1 1	-	-	-	-	-	-	-	-	-	948	-	-	-	-	-
Chemaco SPZ 325	6 -11	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 326	6-II	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 327	ιII	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 327-MS	. 1	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 329	6-11	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
Chemaco SPZ 330	6-11	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
•	6-11	-	-	-	-	-	-	-	-	-	941	-	-	-	-	-
•	6-11	-	-	-	-	-	-	-	-	-	941	-	- 1	-	-	-
Chloromethyoxetane, 3,3 bis- Chromalloy W-2 coating on		-	1076	-	-	-	-	-	-	-	-	-	1505	-	-	-
nolybdenum-titanium alloys .	6- <u>2</u> .	-	-	-	-	-	-	-	-	-	-	-	1505- 1509	-	-	-

	Т	т	Τ		т—							·				
Material Name	Volume	Density	Melting Point	ileat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
	1	410	410	-	-	410	412	414	416	418	420	-	422- 426	428- 432	-	434
	1	-	-	-	-	-	412	-	416	-	420	-	-	-	_	.
	2-11	573	-	-	-	873	875		877	_	-	_	_	_	_	
Chromium + Aluminum + ΣX_i .	2-11	-	-	-	-		-	855	-	- 1	_	.	_	_	_	_
T T T T T T T T T T T T T T T T T T T	2-1	-	62	-	-	-	64	66	_	_	_	_	_	_	_	_
Chromium + Iron + ΣX _i	2-11	857	-	-	-	-	-	859	-	_	861	_	_	_	_	
Chromium + Molybdenum	2-1	-	-	-	-	-	-	-	_ [_	68		_	_	_	_
Chromium + Molybdenum + $\sum X_i$.		863	-	-	-	-	-		_	_	865	_		l	-	
Chromium + Nickel		-	-	-	_	-	-	_	_	_	70	- 1		-	-	-
Chromium + Nickel + ΣX_i		-	867	-	-	-	-	_	_	_	_"	- 1	ı	-	-	-
Chromium + Silicon		72	-	-	_	-	_	_	_	- 1		ij	-	-	-	-
Chromium + Silicon + ΣX_i	2-11	869	-	- 1	-	-	_	-	_	-	[]	_	-	- 1	-	-
Chromium + Tungsten		74	-	_	-	_	_				76	- }	-	-	-	-
Chromium + Tungsten + ZX _i	2-11	871	_	_	_	_	٠ _ ا	_	-	_	"i	-	-	-	-	- 1
Chromium alloys (special designations)		ļ						_	-		-	-	-	i	-	-
Ferrochromium	2-11	-	-	- 1	-	-	-	859	_	_	_	- 1		- 1	I	
Aluminothermic chromium .	2-11	-	-	-	-	_	_	859	_	_	- 1	-	-	-	-	-
Chromiu , aluminides		ł	- 1	I	- 1	- 1	-	~~	_ {	- 1	- !	-	-	-	-	-
CrAl	6-1	_	_	_	_	_	_			!	ا۔	-			ı	ı
1 1	6-1	-	_	_	_		-	-	-	-	5	-	- [-	-	-
	6-1	_	3	_	- 1	-	-	-	-	-	5	-	-	-	-	-
	6-1	_	158	_		-	-	-	-	-	5	-	-	-	-	-
Chromium borides	-	1		_	-	-	-	-	-	-	-	-	-	-	- j	-
CrB	6-1	164	164	_	ı	1	- 1					i			1	i
	6-1	164	164	- 1	-	•	- [166	-	-	-	-	-	-	-	-
1 1	6-1	_	164	-	-	-	-	166	-	-	158	-	-	-	-	-
1 - 1	6-1	- 1	164	-	-	-	-	-	-	-	-	-	-	-	-	-
i '	_ [-		-	-	-	- !	-	-	-	-	- 1	-	-	-	-
	6-1	-	164	-	-	-	-	- j	-	-	-	-	-	-	-	-
Chromium (di-)boride + + Chromium-molyhdenum	6-1	-	164	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (di-)boride +	_	913	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (di-)boride + + Vanadium (di-)boride		723	-			-	-	-	-	-	-	- j	-	-	-	-
Chromium carbides					-	-	-	- }	_	-	-	-	-	-	-	-
CrC	.	-	39	.	_							- 1				
Cr ₂ C ₂		39	39	[]		-	-		-	-	-	-	-	-	-	-
Cr _c C	- 1	-					-	41	-	-	45	-	-	-	-	-
Cr ₂ C ₂						-	-	43	-	-	-	-	-	-	-	-
Cr ₁ C ₂	ı	-	- 1	-	-	-	-	43	-	-	-	-	-	-	-	-
2-103		- j	39	-	-	-	-	43	-	-	-	-	47	-	-	-
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Material Name	Volume	Denaity	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Chromium carbides (cont.)												-				-
Cr ₂₂ C ₆	5	-	39	-	-	-	-	-	-	° _	_	-	۱.	_	١.	۱.
Chro-nium carbide-cobalt blend oa iroa	6-11	-	-	-	-	-	_	_	_	_	_	1407	1409	 -	 -	
Chromium-molybdenum silicides					l											
(Cr, Mo) Si ₂	6-I	523	-	! -	-	-	-	-	-	-	-	-	_	_	۱.	l _
(Cr, Mo) si	6-I	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-molybdenum-silicon cermeis	6-E	925		-	-	-	-	-	-	-	-	-	-	-	_	_
Chromium-niobium intermetallics (Cr ₂ Nb)	6-1	-	683	-	-	-	_	-	-	-	-	-	-	-	_	_
Chromium nitrides																
CrN	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr ₂ N Chromium (sesqui~) oxide (Cr ₂ O ₂)	5 4-i	-	621	-	-		130	132	_		134		100	240		
Chromium (sesqui-)oxide + + Aluminum oxide											1.07	-	136- 138	140	-	-
Chromium (sesqui-)oxide +	4-1 5	-	-	-	-	-	679	-	-	-	681	- j	683	-	-	-
Chromium (sesçai-) oxide + + Nickel (mon-) oxide		-	-	_	-	-	685	-	-	-	-	-	769		-	-
Chromium (sesqui~)oxide + + Niobium (pest-)oxide	4-1	-	-	_	-	-	687	-	-	_	_		_	_	_	-
Chromium (sesqui-)oxide + + Titanium-chromium inter- metallics	5	-	-	-	-	-	-	-	_	-	-	_	771-	775	-	-
Chromium (sesqui-)oxíde + + Yttrium oxíde	4-1	_	_	_	_		_	_					773			İ
Chromium phoephides (CrP)	- 1	635	635	_ [_		639		_	į		-	689	-	-	-
Chronium eilicides		-			!	İ	~~			-	-	-	-	-	- 1	-
CrSi	5- <u>1</u>	.	J8 i	-	-	-	382	385	_	_	389	_	_			ĺ
	6-1	-	381	-	-	-	393	385	387	_	389			[]	_	<u> </u>
	6-1	-	381	-	-	-	-	535	-	-	389	-	391- 393	395	-	-
	6-1	-	-	-	-	-	-	-	-	-	389	-	-	_	_	.
_ '	6-1	-	381	-	-	-	-	-	-	-	-	-	-	-	-	- 1
	6-1	-	-	-	-	- [-	385	-	-	-	-	-	-	- 1	- [
Chromium silicide cermets	6-11	-	-	-	-	-	-	-	-	-	915	-	-	-	-	-
+ Molybdenua (di-)silicide	6-I	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-
· · · · · · · · · · · · · · · · · · ·	6-П	925	-	-	-	-	-	-	-	-	-	_	_	-	_	_
Chromium-tantalum intermetar- lics (Cr ₂ Ta ₂)	64	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaportzation	lient of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Chromium-titanium intermetal- lics + Chromium (sesqui-) - oxide	5	-	-	-	-	-	-	-	-	-	926	-	928- 930	932	-	-
Chromium-titanium intermetal- lics + Copper cermets	5	917	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium-titanium intermetal- lics + Molybdenum cermets	6-II	919	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium zirconate (Cr ₂ O ₃ · ZrO ₂)	4-11	-	-	-	-	-	-	-	-	-	1508	-	-	-	-	-
Chromium-zirconium intermetal- lics (Cr ₂ Zr)	6-1	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Chronin	2- <u>I</u>	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-
Chrycote coating on copper	6-11	-	-	-	-	-	-	-	-	-	-	-	1499	-	-	-
Clad steel	6-11	-	-	-	-	-	-	-	-	-	1267	-	-	-	-	-
Clinoenstatite	4-11	-	-	-	-	-	-	-	-	-	1295	-	-	-	-	-
Coatings																
Aluminide on nicoium	6-11	-	-	-	-	-	-	-	-	-	-	-	1435- 1437	1439	-	-
Aluminide on titanium	6-11	-	-	-	-	-	-	-	-	-	-	-	1447- 1449	1451	-	-
Aluminized-silicone paint on titenium	6-11	-	-	-	-	-	-	-	_	-	-	-	-	1497	-	-
Aluminum on mylar	6-11	-	-	-	-	-	-	- '	-	- 1	- '	-	-	1287	-	-
Aluminum oxide on AISI 446 .	6-11	-	-	-	-	-	-	_	-	۱ - ۱	-	_	-	1349	_	_
Aluminum phosphate on nickel	6-11	-	-	-	-	-	-	-	-	-	-	-	1431	-	-	-
Barjum titanate on niobium- zirconium alloys	6-11	-	-	-	-	-	-	-	_	-	-	-	1371	-	-	-
Boron on molybdenum	6-11	-	-	-	-	-	-	-] -	-	-	_	1289	-	-	-
Boron on niobium-zirconium alloys	6-11	-	-	-	-	-	-	-	_	-	-	-	1291			-
Boron carbide on Inconel X .	5-71	-	-	-	-	-	-	-	-	-	-	- 1	1403	1405	-	-
Calcium titanate on niobiura- zirconium alloys	6-11	_	_	_	_	_	_	_		.	_	_	1371	_	_	
Carbon on melybdenum	6-11		!						•	1	1	1293	1295			
Chromalloy W-2 on molyb- denum-titanium alloys	6-11	-	-	-	-	-	-	-	-	-	-	-	1505-	-	-	-
Chromium carbide-cobalt blend on iron	6-11		_	-	_	_	_			_	_	1467	1509	_	_	
Chrycote on copper	ŧ l		_	_	_		_		_		-	-	1499			
Cobalt oxide on tantalum		!	_	-	-	_	_	-	-	-	-	-	1373-	ł	-	_
Copper on mylar			_	_	_	_	_	_		_	_	_	1375		_	_
Dow-Corning XP-310 on	Ì				i 				1	1	_					_
Ti-75A (AMS 4901)	e-11	-	-	-	-	-	-	-	-	-	-	-	-	1497	-	-
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Material Name	Volume	Denaity	Melting Point	Heat of Fusion	lie 1 of Vaporixation	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Therinal Linear Expansion	Thermal Absorptance	Thermal Emittanco	Theamal Reflect ace	Therms! Transinitionos	Vapor Pressure
Conings (cont.)																
Durak MG on molybdenam- titanium alloy	6-11	-	-	-	-	-	-	-	-	-	-	-	1501- 1503	-	-	
Enamel on AISI 310	6-11	-		-	-	-	-	_	-	-	-	-	1515	-	-	_
Enamel on AISI 321	6-11	-	-	-	-	-	-	-	-	-	-	-	1513	-	- !	<u> </u>
Enamel on Inconel	6-11	- }	-	-	-	-	15:1	-	-	-	-	-	-	-	-	-
Gold on mylar	6-11	-	-	-	-	-	-	-	-	-	-	-	-	130€	-	-
Gold on titanium	6-11	-	-	-	- 1	-	-	-	-	-	-	-	1303	.305	-	-
Graphite, pyrolytic, on tantalum	6-11	-	-	-	-	-	-	-	-	-		-	1297- 1299	-	-	-
Hafnium (di-)oxide on tungsten	G-13	-	-	-	-	-	-	-	-	-	-	-	137?- 1379	-	-	-
Hastelloy C on AISI 310	6-11	-	-	-	-	-	-	-	-	-	-	-	1337	-	-	
Hastelloy X on AISI 210	6-II	-	-	-	-	-	-	-	-	-	-	-	1339	- 1	-	١.
lron(ic) oxide on stellite no. 25 (L-605)	6-II	-	-	-	-	-	-	-	-	-	-	-	1381- 1363	-	-	
Iron titanete on niobium- zireonium alloys	6-II	-	-	-	-	-	-	-	-	-	-	-	1395	-	-	
Kennametal K-151A on AISI 310	6-II	-	-	_	-	-	-	-	-	-	-	-	1491	-	-	
Kennametal K-152B on AISI 310	6-11	-	-	-	-	-	-	-	-	-	-	-	1493	-	-	
Magnesium fluoride on quartz	6-Ⅱ	-	-	-	-	-	-	-	-	- 1	-	-	-	1425	2427	
Molybdenum on iron	6-11	-	-	-	j -	-	-	-	-	-	-	1309	1311	-	-	
NBS coating A-418 on Income?	6-11	-	-	-	-	-	-	-	-	-	-	-	1361- 1363	-	-	
NBS coating A-418 on stain- less steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1365- 1367		-	<u> </u>
NBS coating N-143 on Incomel	6-11	-	-	-	-	-	-	-	-	-	-	-	1353- 1355	-	-	
NBS coating N-143 on stain- less steel	e-11	-	-	-	-	_	-	-	-	-	-	-	1357- 1359	-	-	
Nickel aluminide on Inconel .	6-11	-	-	-	-	-	-	-	-	-	-	-	1	1457	-	
Nickel chromite on nichium- zirconium alioys	6-1I	-	-	-	-	-	-	-	-	-	-	-	1397	-	-	
Nicket-chromium alleys on Inconel X	6-11	-	-	-	-	-	-	-	-	-		-	1533	1335	-	
Niobium akıminide on	6-11	_	_	_	۱ -	_		-	Ì -	_	۱.	_	۱.	1456	_	
	1	ł .			_	-	_	-		_]	-	1313	1		Į
Platinum on copper	6-11]		1 _		_		_	_		_	-	1317	1379	
•	6-11]	_]	_	_	_	-]]		1315	•	[_ [
Platinum on stainless steel .											, -					z .

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Material Name	Volune	Density	Matting Point	at of Punion	Heat of Vaporization	Heat of Mahilmasion	Electrical Registrical	Specific fleat	Therinal Combutivity	Thermal Wifturity	Thermal Linear Expansion	Thermal Absorptarro	Thermal Emiltmos	Thermal Reflectance	Thermal Transmillance	Vapor Pressure
	۸٥	Ä	32	Heat	₹.5	3 T	2 2 2 2	ž	ĘŜ	ÉŠ	£Š	£\$	žž.	2 %	44	*
Costings (cost.)																
Rokide A on AISI 446	6-II	-	-	-	- :	-	-	-	-	-	-	-	-	1351	-	-
Rokide C on tHankun allo, Ti-6 Al-4 V	6-D	-	-	-	~	-	-	-	-	-	-	-	1365 1367	-	-	-
Silicide on molytelenera	6-11	-	-	-	-	-	-	-	-	-	-	-	1467	1671	-	-
Silicide on tantalum	6-II	-	-	-	-	-	-	-	-	-	-	-	1473- 1473- 1473	1477	-	-
Silicide on thanks	E-71	-	-	-	-	-	-	-	-	-	-	-	1679	1653	-	-
Silicide on tangaten	6-II	-	-	-	-	-	-	-	-	-	-	-	3451 1455- 1457	1459	-	-
Silicon carbide on nichian- zirconium alloys	6-11	_		_		_	_	_		-	~	_	1415	-	-	_
Silicon carbide on tantalem .	6-E	-	-	-	-	-	-	-	-	-	-	-	1411- 1412	-	-	-
Silicon (mon-)oxide on aluminum	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1399	-	-
Silicon (di-)oxide on alexanem	6-B	-	-	_	_	-	-		-	-	_		-	1291	_	-
Silicone on facount	6-11	_	_	~	_	-	:435	_	_	-	_	_	_	_	_	-
Silver on AISI 221.	6-11	- 1	-	-	_	_	-	-	-	_	_	-	-	1321	-	-
Silver on mylar	6-E	- 1	-	-	-	_	-	-	-	-	-	_	_	1323	-	-
Silver sulfide on silver	6-II	-	-	-	-	-	-	-	-	-	-	143î	1623	-	-	-
Strontism tRanate on AISI 319	6-II	-	-	-	- 1	-	-	-	-	-	-	-	1333	-	-	-
Tantalum aluminide on tantalum	6-11	-	-	-	-		-	-	-	-	-	-	1461- 1463	165	-	-
Tantales carbide on lacouel X	6-11	-	-	-	-	-	-	-	-	-	-	-		1415	-	
Transma (ds-) oxide and sheatness on molybdonum	6-B	-	-	-	_	-	-	-	-	-	-	-	1355	-	-	-
Tangetes on Incodel X	6-11	-	-	-	-	-	-	-	-	-	-	-	m	1331	-	-
Tempsica ca iron	6-II	-	-	-	- 1	-	-	-	-	-	-	1225	1327	-	-	-
Tageten-cohak alloys on Inconel X	6-II	-	-	-	j .	-	-	-	-	-	-	_	1341	LO		-
Tangsten carbede on iron	6-II	-	-	-	i -	-	-	-	-		-	1421	1423	-	[-]	-
Zirronium (di-)oscile on Becazel	6-23	-	-	-	-	-	-	-	-	-	-	-	-	1397	-	-
Zirconium (di-jenide on Inconcl X	6-E	-	-	-	-	-	-	-	-	-	-	-	7344	1603	-	-
C.tak (Co)	1	436	436	-	-	-	435	480	465	- 1	444	445	426 447	-	-	-
Coball + Chromism + $\Sigma \Sigma_i$	2-13	579, 982	รรร	-	-	-	-	91.	556 553	539	596 596	-	303 914	926	-	-
Cobalt + Suppor + SX ₁	2-2	-	\$19	-	-	-	5 230	-	-		-	-	-	-	-	-
Cobalt + Gold	2-i	-	-	-	-	-	78	-	-	-	; -	-	-	-	-	-
Cobalt + Gold + EX ₁	2-E	-	ध्य	-	-	-	924	-		-	-	-	-	- 	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vapor, zatien	Heat of Sublimation	Electrical Registivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Theymal Linear Expansion	Thermal Absorptance	Therinal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Cobalt + Iron	2-I	-	-	-		80	82	84	-	-	-	-	86	-	-	88
Cobalt + 1ron + $\Sigma X_1 \dots \dots$	2-II	-	-	-	-	-	-	-	-	-	925- 930	-	-	-	-	-
Cobalt + Manganese + ΣX_i	2-11	-	-	_	-	-	-	_	-	-	932	-	-	-	-	-
Cobalt + Nickel	2-1	92	-	-	-	90	-	- 1	-	-	-	-	94	-	-	96
Cobalt + Nickel + ΣX_i	2-11	-	-	-	- 1	-	-	-	934	936	938	-	-	-	-	-
Cobalt + Palladium + ΣX_i	2 -11	-	940	-	-	-	942- 944	-	-	-	-	-	-	-	-	-
Cobalt + Vanadium	2-1	_ '	_	_	_	-	-	_	-	-	98	-	_	•	-	_
Cobait alloys (special designations)																
Hasterley 25	2-11	-	-	_	_]	-	-	-	_	_	898	-	-	-	-	_
Haynes 152	2-11	-	-	_		_	- 1	_	_	_ '	898		_	-	_	_
HE 1049	2-11	_	_	_	-	_	_	884	888	_	900	_	_	_	_ [_
J-1570	2-11	_	_	_	-	_	-	_	934	_	938	-	_	_	_	_
Jessop G32	2-11	879	,	-	_	_	_	_	888	-	892	_	_ '	_ '	_	-
Lohm	2-I	-	_	_	_	_	_	_	138		-	_	_	_ '	-	-
MAR-M302	2-П	_	_	_	_	_	-	_	_	_	898	-	_	_	_	_
PWA-653-A	2-11		_	_	_		_	_	_	_	898	_	_	_	_	_
Rexalloy 33	2-11	_	_	_		_ '		_	_	_	906	_	_	_	_	~
S-816	2-11	-	-	-	-	-	-	-	888, 934	890, 936	896, 938	-	-	-	-	-
SM-302	2-11	_		_	_	_	_		-	-	898	_		_	_	_
Stellites (see Stellite)									1		""					
V-36	2-11	_	_	İ _	_	_	_	١.	-	_	896	_ '	ا ا	_	_	_
Vitallium	2-11	_	879	_		_	_			[894					
\v1-52	2-11]	1 -	_	_	-			388]	_	_				_
X-40	2-11	_	_		_	_		_	888	i] _]		_
x-63	2-11	_			_			[888			_				
Cobalt aluminates	~~	-		_		-	_	-	000	-		-	} _	_	-	
CoO·Al ₂ O ₃	4-11	۱.	١ _	_	١.	_	_	_	_	_	995		_	_		
Co ₂ O ₃ ·Al ₂ O ₃	4-11	_	_								995			_		
Cobalt alum ade (CoAl)	6-1	_		-				-			7	1				
Cobalt beryllide (CoBe)	6-I	_	158	-						[l <u>'</u>	[! -		
Cobalt blue glass	4-11		150	[-		-		-	1847	1849	1951	_
Cobalt (mono-) boride (CrB)	6-1	_	296	-			-	! -]			1301	
Cobalt (mono-) toride (CIB;	5		294	-		-	-	i		[]			_
Cobalt-chromium alloys	ľ	-	254		-	[i -	ļ <u>-</u>		-	_	[- -	_		
Titanium (di-)boride cermet .	e-11	1	930	-	-	=	-	-	-	=	-	-	-	-	-	-
Cobalt—fromium intermetallics	6-I	-	683	-	-	-		-	-	-	-	-	-	-	-	-
Cobalt ferrite (CoO Fe ₂ O ₂)	4-11	-	-	-	-	-	1071	1073	-	} -	-	-	-	-	-	-
Cobalt-lead silicate glass	4-11	-	ļ -	-	-	-	1735	-	-	-	-	-	j -	-	-	-

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SECTION OF THE SECTION OF SECTION

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Fypansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittence	Vapor Pressure
Cobalt-molybdenum intermetal- lics (CoMo)	6-1	-	683	-	-	•			-	-	_	-	-	-	-	~
Cobalt-niobium intermetallics (Co_5Nb_2) Cobalt oxides	6-I	-	683	-	-	-	-	-	-	-	-	-	-	-	-	~
C ₀ O	4-1	- 1	-	_	-	-	-	142	-	-	146	-	-	-	- 1	_
Co ₃ O ₄	4-1	-	-	- 3	- 1	-	_	144	_	-		_	_	_	_	_
Cobalt oxide coated tantalum	6-11	-	-	-	-	-	-	-	-	-	-	-	1373- 1375	-	-	-
Cobalt(ous) oxide + Copper(ic) oxide	4-1	ű	-	-	-	-	-	691	-	-	-	-	-	-	-	-
Cobalt(ous) oxide + Nickel (mon-)oxide	4-I	-	-	-	-	-	-	693	-	-	-	-	-	-	-	-
Cobalt (ortho-) phosphate (3 CoO·P ₂ O ₂)	4-11	_	-	-	-	-	-	-	-	-	1169	-	-	-	-	~
Cobalt phosphide (Co ₂ P) Cobalt silicides	5	-	635	-	-	-	-	-	-	-	-	-	-	-	-	-
;			207				200	403	529		402					
CoSi	6-I	-	397	-	-	-	399	491		-	403	-	-	-	-	-
CoSi ₂	6-I	-	397	-	-	-	-	-	-	-	-	-	-	-	-	-
CoSi ₃ . ,	6-1	- 1	397	-	-	-	-	-	-	-	-	-	-	-	-	-
Co ₂ Si	6-1	-	397	-	-	-	- 1	-		-	-	-	-	-	-	-
Co _g Si	6-1	-	397	-	-	~	- 1	-	-	-	403	-	-	-	-	-
Cobalt-titanium intermetallics																
CoTi	6-1	-	683	-	- 1	-	-	-	-	-	-	-	-	-	-	-
CoTi ₂	6-1	-	683	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt-tungsten intermetallics (CoW)	6-1	-	683	-	-	-	-	-	-	-	-		-	-	-	_
Cobalt-zirconium intermetallics (Co ₄ Zr)	6-1	-	693	_	_	-	_	.	_	_	_	-	_	-	-	_
Coke	1	-	-	-	-	-	85	-	87	۱ -	_	٠.	-	-	- 1	-
Coke, graphitized	1	105	_	_	-	-	-	-	-	-	_	_	_	_	_	_
Composite systems					1	1	1	1					}			
Alumina bubbles - graphite fibers system	6 - II	-	-	_	_	-	_	_	1279	_	_	_	_	_	_	-
Dexiglas paper - aluminum foil - graphite fibe- system .	6 - II	-	-	-	_	_	_	_	1283	_	_	_	_	_	_	_
Fiberfrax paper - tantalum shield - graphite fibers system	6-11	_	_	_	_		_		1285	_		_		_		-
Graphite fibers -tantahun shield system	6-11	_				_	_		1281							
Concrete	5	_	_]]	-	-		1027		I -	· -	-	-		-
Conolon N-1 laminate	6-II	_	-	} _		1	-	-	1021	_	1174		-	-	-	•
		_	_				_]	1	Ì	l	1	1833	1835	1827	-
Container glasses	4-II	-	_	-	1	ſ	}	-	1261	-	"	-	1	1		-
Contracid	2-11	l	-	-	-	-	-	-	ł	-	950	-	-	-	-	-
Copolyvinyl chloride + Acetate .	0-1	_	-	-	-	^	-	-	-	-	930	"	-	-	-	-

Material Name	Volume	Denaity	Melting Point	Heat of Furion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Reat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Copper (Cu)	1	452	452	452	452	452	454	456	458	460	462	464	466-	472-	-	479
Copper, commercial coalesced.	1	452	_	_	۱ ـ	_		l					470	477		
Copper DS (British aircraft material spec.)	1	_		_				_		-	-	-	-	-	-	-
Copper, electrolytic	1	452	452	_	_	_	_	456		-	_	-	-	472	-	-
Copper, electrolytic tough pitch (Fed, Spec. QQC-502)	1	452	_	_	_	_				-	462	-	466	472	-	-
Copper, electrolytic tough pitch (Fed. Spec. QQC-576)	1			_			-	456	458	-	462	464	468	474	-	-
Copper, OFHC	li l	_			-	-	-	456	458	-	462	464	468	474	-	-
Copper, tellurium	2-1	_				-	-	-	458	460	-	-	-	-	-	-
Copper coated with chrycote	6-11	_	! _	_	-	-	-] -	-	-	152	-	-	-	-	-
Copper coated with platinum coating	6-11		_		1		-	-	-	-	-	-	1499	-	-	-
Copper coating on mylar	6-11	í	i	-	-	-	-	-	-	-	-	-	1313	-	-	-
Copper + Aluminum		100			-	-	-	-	-	-	-	-	-	1301	-	-
Copper + Aluminum + ΣX_1	2-11		_	_	_	-	102- 104 946	106	108	-	110	-	-	-	-	-
				_	-	-	240	-	946	-	950	952	954- 958	960	-	-
Copper + Beryllium	2- <u>I</u>	-	-	-	-	-	-	112	-	-	-	_	-	_	_	_ [
Copper + Chromium	2-I	-	-	-	-	-	114	-	116	-	-	-	_	_	_	
Copper + Chromium + \(\Sigma \text{X}_i\). Copper + Cobalt	2-11	-	-	-	- [-	962	-	964	-	-	-	-	_		
Copper + Cobalt + ΣX_i	2-I	-	-	- j	-	-	-	-	118	-	-	-	- 1	-	_	
	2-11	-	966	-	-	-	968	-	970- 972	-	- [-	-	-	-	-
Copper + Gold				İ				- 1		ı	1	į			1	
CuAu ₃	2-1	-	-	-	-	-	-	204	-	-	206	_	_	- 1	_	
Cu ₃ Au	2-1	-	- i	- j	-	-	-	204	-	-	206	-	-	_	_	
Copper + Iron	2-1	-	-	-]	- [-	120	122	124	-	-	-	-	_	_	
Copper + Iron + ΣX_1	2-11	-	-	-	-	-	-	-	-	-	-	-	974	-	-	- 1
Copper + Lead + ΣX_i	2-I	126	-	-	-	-	-	-	-	-	128	-	-	-	-	_
Copper + Manganese	2-11	-	-	-		-	-	-	-	-	976	-	-	-	-	-
I _	2-1	-	-	-	-	-	130	132	-	-	-	-	-	-	-	-
1 _ ·	2-11 2-1	-	-	-	-	-	978	-	980	-	-	-	-	-	-	-
		-	-	-	-	-	134	136	138	-	-	-	-	-	-	-
	2-11	-	-	-	-	-	982	-	984- 986	-	988	-	-	-	-	-
1 1	2-1	-	-	-	-		140	-	142	-	-	-	-	-	-	_
l	2-11	-	990	-	-	- 1	1	-	-	-	-	-	-	-	-	-
i	2-I 2-I	-	-	-	-	- 1	144	-	-	-	-	-	-	-	-	-
	2-1	-	-	-	-	-	146	-	-	-	-	-	-	-	-	-
	2-1	_	-	-	-	-	-	-	-	-	994	-	-	-	-	-
		150	-	-	-	- j	-	-	-	-	148	-	-	-	- İ	-
		100	-	-	-	-	-	-	-	-	152	-	-	-	-	-
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Material Name	Volume	Density	Melling Point	Heat of Fusion	Heat of Vaporization	Heat of	Electrical	Resistivity	Specific Heat	Conductivity	Diffueivity	Inermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal	Transmittance	Vapor Pressure
Copper + Tin	2-I	154	-	-	-	-	15	6	$- T_{i}$	58		160	_				+	_
Copper + Tin + ΣX_i	2-11	-	-	-	-	-	-	Ι.		96	- 1	998		162	-	-		-
Copper + Titanium	2-I	164	164	-	-	-	-	Ι.		i	_ `	_		-	-	-	1	-
Copper + Uranium	2-I	166	166	-	-	_	-	Ι.		ı]		-	-	-	-	- [.	-
Copper + Zinc	2-1	168	-	-	- 1	-	170	0 17		i	74		-	-	-	-		-
Copper + Zinc + ∑X _i	2-II	-	-	-	-	-	-	-				192		176- 180	162	-		-
Copper + Zirconium	2-1	184	.							-		04		-	-	-	'	^
Copper + Zirconium + ΣX_i		-		-	-	-	186	Į	-`		-	-	-	-	-	-	Ι.	.
Copper alloys (special designations)				-	-	-	1006	-	100	8	1	-	-	-	-	-	-	.
Admiralty nickel	2-11	-	-	- 1	_	_	_	-	İ		[- 1	ı			ı
Aterite	2-11	-	-	-	_	_		-	-	Ι.	- 1	88	-	-	-	-	-	.]
	2-11	-	-	-	_	_	978	-	-	-	10.		-	-	-	-	-	.
Monels (see Monel)	- 1	-	Ì	I	ļ	Ì	j	1 -	-	-	· ·	•	-	-	-	-	-	
	?-n	-	-	-	-	- 1	_	_	100		-	1			i		1	
	-11	-	-	-	-	_ [_	-	100	1	1	J	1	-	- ¦	-	-	- 1
	:-II	-	-	-	-	- 1	_		996				- 1	-	-	-	-	
	-1	-	-	-	-	_	_	_	15	1	-		- 1	-	-	-	-	ļ
1	-П	-	-	- [-	-	_	_	-	ΉΞ		- 1	ı	-	-	-	-	-
Tempaloy 841 2	-11	-	-	-	-	-	_	_			98	7	- '		-	-	-	
Copper ferrites					- 1					-	33	۱ ۱	• •	-	-	-	-	
CuO · Fe ₂ O ₃	-II	-	-	-	-	-	1075	1077	_	_	_	Ι.	ı		- 1		Į	
Cu _X Fe _{3-X} O ₄ 4.	-11	-	-	-	-	-	_	1077	_	_					-	-	-	1
Copper indium telluride (CulnTe) 5.	- 1	-	-	-	-	-	-	-	572	_				- 1	-	-	-	
Copper oxide (CuO) 4.	-1	-	-	-	-	-	148	150	-	١.	1.			- 1	-	-	-	
Copper silver indium tellurides (Ag _X Cu _{1-X} InTe ₂) 6-	,	_	İ		i			ł	1	1		-			-	-	152	<u>' </u>
Cordierite 4-		-	-	~	-	-	-	-	640	-	-	-	. -	. .	.	_	۱.	
Cordierite 202	-			-	-	-	1298	1300	1302	-	1304 1306		-	· -	.	-	-	
Cordierite, barium 4-	п .	-	_	_		-	-	-	1302	-	-	-	-	-	.	-	-	
Cordierite, lead 4-:	n .	-	_	_	_	_	-	-	-	-	1217		-	-		-	-	
Cordierite, lead-barium 4-1	 -	.	_	_		_	-	-	-	-	1252 1254	-	-	-		-	-	
Cordierite bodies	İ		-	j		_	-	-	-	-	1256 1258		-	-	- 1	-	-	
Complex 0040 -1	1	٠ ٠	- j	-	-	-	-	-	-	-	1310	1	_	_	1			
Coming 1772 -1-	1	٠ ٠	-	-	-	-	-	-	1795	1793	-	_		-		-	-	
001ming 1/23 giass 4-I	" -	' ·	-	-	-	-	-	1675	-	1677	-	١.	1679	168	. ,,	63-	-	1
Corning ?740 glass 4-I	1 -	-	. .	-	-	-	-	1697	-	1701	_	_	1705		16	85 11-	-	
Corning 7900 glass 4-E	1 -	1.	. .	.	_			, <u>, </u>				1		-	17		_	1
					-	-	-	1655	-	1661	-	-	1665	1669	16°	71- 73	-	
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Material Name	Volume	Density	Multing Point	Heat of Fusion	Hent of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Em.itance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Corning 7940 glass	4-11	-	-	•	-	•	•	1655	-	-	-	-	1665	1669	i671- 1673	-
Corning 9325 glass	4-11	-	-	-	-	-	-	-	-	1687	-	-	-	-	-	-
Corning 8362 glass	4-11	-	-	-	-	-	-	-	-	1749	-	-	-	-	-	- ¦
Corning 9752 glass	4-11	-	-	-	-	-	-	-	-	-	-	-	1847	1849	1851	- [
Corundum	4-I	-	-	-	-	-	-	8	-	-	22	-	-	-	-	-
Cresol resin	6-11	-	-	-	-	-	-	1004	-	-	-	-	-	-	-	-
Cristobalite	4-1	-	-	-	-	-	-	-	-	-	367	-	-	-	-	-
Crown glass	4-11	1693	1693	-	-	-	-	1697	-	-	1723	-	-	-	-	-
Crystolon-R	5	-	-	-	-	-	-	-	-	-	-	-	131, 135	-	~	-
Curium (Cm)	1	481	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ם	li															
Dexiglas paper - aluminum foil - graphite fibers composite system	6 - II	-	_	-	-	-	-	_	1283	-	-	-	_	_	-	-
Diall 50-01 resin		-	-	-	_	-	1111	-	-	i -	- ,	-	-	-	-	-
Diall 50-51 resin	6-II	-	-	-	-	-	1211	-	-	-	-	-	-	-	-	-
Diall 50-52 resin	6-11	-	-	-	-	-	1111	_	-	-	-	-	-	-	-	-
Diall 52-01 resin	6-11	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diall 52-20-30 resin	6-11	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diallylphthalate, reinforced	6-11	-	-	-	-	-	1111	-	-	-	-	-	-	-	-	-
Diamond	1	392	392	-	-	392	-	394	396	-	398	-	-	40C	-	-
Dihydroperfluorobutyl acrylate, 1,1-	6 - II	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dow-Corning XP-310 on Ti-75A (AMS 4901)	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1497	-	-
Durak MG coating on molybde- num-titanium alloys	6-11	-	-	-	-	-	-	-	-	-	-	-	1501- 1503	-	-	-
Duranickel 301	2-11	-	-	-	-	-	-	-	-	-	1117	-	-	-	-	-
Durchy	5	-	-	-	-	-	-	-	-	-	-	-	821	-	-	-
Dures 16274	6-11	-	-	-	-	-	982	-	-	-	-	-	-	-	-	-
Dares 16694	6-D	-	-	-	-	-	1111	-	-	j -	-	-	-	-	-	-
Duroid 5600	6-II	1097	-	-		-	-	-	1099	-	-	-	-	-	-	-
Dynakon rod F	e-11	-	-	-	- 1	-	-	-	-	-	i109	-	i -	-	-	-
Dynakon sheet A3A	6-11	-	-	-	-	-	-	-	-	-	1109	-	-	-	-	-
Dysprosiz	4-1	154	154	-	-	-	-	156	-	-	158	-	-	-	-	-
Dysprosium (Dy)	1	483	483	483	483	483	485	-	-	-	-	-	-	-	-	487
Dysprosium + Tantalum + ΣX_i .	2-□	-	-	-	-	-	-	-	-	-	1010	-	-	-	-	-
Dysprosium aluminate (Dy ₂ O ₃ ·2 Al ₂ O ₃)	4-11	-	-	-	 	-	-	-	-	-	997	-	-	-	-	-
			_													

Material Name	Volume	Density	Molting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expunsion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Promsure
Dysprosium borides																
DyB ₄	6-1	295	-	-	-	-	-	-		-	-	-	-	_	-	-
DyB _e	6-1	295	-	-	-	-	-	-	-	-	-	-	-	-	-	~
Dysprosium carbide (DyC ₂)	5	294	-	-	-	_	-	-	-	-	-	_	-	_	_]	_
Dysprosium-cobalt intermetallics		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
СуСо₂	6-1	680	-	-	-	_	-	-	-	-	-	_	_	_	-	_
DyCo _s	6-1	680	_	-	-	-	-	-	-	-	_	_	_	-	-	_
Dysprosium hydride (DyH ₂)	5	467	-	-	-	-	-	-	-	-	-	_	-	_	_	-
Dysprocium niobate (D-O ₂ ·Nb ₂ O ₃)	4-11	_	_	_	_		-	_	_	-	1123	_	_		_	_
Dysprosium oxide (Dy2O ₃)		154	154	-	_		_	156	_	_	158	_	_			
Dysprosium oxide + Cerium	4-1	-	101		_			-		_	695	_	_		_	_
Dysprosium oxide + Uranium	4-]	-	_	-	-	_	_	_	_	_	697					-
Dysprosium oxide + Zirconium (di-)oxide	4-1	-	-	-	_	-	_	-	-	-	699	-	-	-	-	-
	6-1	52*	524	_		-	527]	_		l	,	-	-	-
Dysprosium sulfides	"	-	32.	-	-	-	•	-	-	-	•	-	-	-	-	-
DyS ₂	5	732		_	_	_	_		_	_	_	_	_	_	-	_
5.0	5	732	732	-	_	_		_		_		-	_	_	_	
Dy ₂ S ₁	5	732	732			-	_	_				_		[_	
	ľ															_
E													İ			
Eastman Intran glasses	1 1	-	-	-	-	-	-	1853	-	-	-	-	-	-	-	-
Eccofoam	6-11	1054	-	-	-	-	-	- 1	1080	-	-	-	-	-	-	-
	6-II	960	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electroconducting glass	4-11	-	-	-	-	-	-	-	-	-	-	-	1839	1841	1843- 1845	-
Electroconducting glass 547-26.	4-II	-	-	-	-	-	-	-	-	-	-	-	1839	1641	1643- 1845	-
Electroconducting glass LOF- 81E-19778	4-II	-	-	-	-	-	-	-	-	-	-	-	1839	1841	1843- 1845	-
Electroconducting glass LGF- PB-19195	4-II	-	-	-	-	-	-	-	-	-	-	-	1839	1841	1843- 1845	-
Enamel on Inconel	6-II	-	-	-	-	-	1511	-	- 1	-	- 1	-	-	-	-	-
Enamel, rinsed-Mason black, on AISI 321	6-11	-	-	-	-	-	-	-	-	-	-	-	-	1513	-	-
Enamel, spinel, coating on AISI 310	6-11	-	-	-	_	-	-	-	-	-	-	-	1515	-	-	-
Enstatile	4-11	-	-	-	-	-	-	-] -	-	1295	-	-	-	j -	-
Epoxide	6-11	1006	-	-	-	-	-	-	1010	-	1012	-	-	-	- 1	-
Epoxide, Hysol 6000-OP	6-II	1006	-	-	-	-	-	-	1010	1082	1012	-	-	-	-	-

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	\top	T	7	T	T^-	T -	1	- -		-					,	
Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of	Heat of	Sublination Electrical	Resistivity Specific Hort	Thermal	Thermal	Thermal Mear	Thermal Absorpance	Thermal Emittance	Thr:mul Reflectance	Thermal Tr Ansmittance	Vapor Pressure
Epoxide, reinforced	6-11	-	-	-	-	-	-	111		7-"-		-		_	_	-
Epoxy, DER352	6-11	-	-	-	-	-	_	100	a _	_	1124				1	
Epoxy and phyophen copolymer resin, reinforced	6-II	_							ĺ			-	-	-	-	-
Epoxy resin	6-11			-	-	-	j -	-	1216	3 -	-	-	-	-	-	-
Epoxy resin, reinforced		-	-	-	-	-	-	100: 111: 111:	5- 1120	1220	1122-	- -	-	-	- -	-
Erbia	4-1	160	-	-	-	_	_	162			1124		•••			l
Erbium (Er)	1	489	489	489	489	489	49				495	-	166 497	-	-	-
Erbium borides									1		""	-	731	-	-	499
ErB ₄ ErB ₆	6-I	295	-	-	-	-	-	-	-	-	_	_		_	_	_
P-24	6-I	295	-	-	-	-	-	-	-	-	-	_	_	_	-	-
Erbium-cobalt intermetallics (ErCo ₂)	5 6-I	294 680	_	-	-	-	-	-	-	-	-	-	-	-	-	-
Erbium-gallium intermetallics (ErGa ₂)	6-1	680	_		_	-	-	-	-	-	-	-	-	-	-	-
Erbium hydride (ErHy	5	467	_	l	-		-	-	-	-	-	-	-	-	-	-
Erbium-manganese intermetallica (ErMn ₂)	6-1	680	_	_	_				-	-	-	-	-	-	-	-
Erbium-nickel intermetallics (ErNi ₂)	6-1	680	-	-	_	_			-	_	-	-	-	-	-	-
Erbium oxide (Er ₂ O ₂)	4-1	160	-	-	-	-	_	162			164		150	-	-	-
Erbium selenides											101	-	168	-	-	-
ErSe	6-I	-	-	-	-	-	367	-	-	-	-	- Ì	_	_	_	
Er ₂ Se ₃ Erbium-silver intermetallics	6-1	-	-	-	-	-	367	-	-	-	-	- [-			
	6-1	680	-	-	-	-	-	-	-	-	-	_	-	_	_	_
Ers	5	732	_	ĺ	İ										- 1	
Er ₂ S ₃	5	732	732	-	- 1	-	-	-	-	-	-	-	-	-	-	-
	- 1	732	732	_	_ [-	-	-	-	-	-	- [-	-	-
Erbium tellurides (Er2Te3)	6-1	-	-	-	_ [638	-	-	-	-	-	-	-	-	-
	6-11	-	-	-	-	_ [-		_	-	348	-	-	-	-	-
Etruria Marl	4-1	-	-	-	-	-	-	-	_	-	962-	-				-
Eucryptite	4-11	.	_	_	_	_			!		612		i	Į		_ [
Europium (Eu)	. 1	501	501	501	501	501	503	- 505	-	- 1	1270	-	-	-	-	-
	6-1	296	-	-	-	-	300		- 1	-	-	-	-	-	-	507
	4-I :	168	168	-	-	-	-	170	-		172		- j	-	-	-
	5 -11	-	-	-	-	-		-	_		705	- -		-	-	-
Europium silicide (EuSi ₂) (5-1 :	523	524	-	-	-	-	-	-	-	-	-	-	-	-	-

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STATEMENT OF THE STATEM

Material Name	Volume	Density	Malting Point	Heat of Fusion	Hent of Vaporization	Hrat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linnar Expansion	Thermal Absorptance	Thum mal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Europium sallides																
EuS	5	732	-	- 1	-	-	-	-	-	-	-	-	-	-	-	-
EuS ₂	5	732	-	-	-	-	-	-	-	- 1	-	-	-	-	-	-
Eu ₂ S ₄	5	732	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Evanohm	2 -1 1	1119	-	-	-	-	1124	-	-	-	-	-	-	-	-	-
F																
Fabrics				Ì												
Fiber glass	6-11	_	_	-	_	_ !	_	_		1269	_	_	_	_		i _
Graphite	6-11	_			_		_]]	1271	_		_		_	_
Nylon	6-II	_	-				_	-	[1273	_ [-]	_	-
Organic fiber	6-11	_	_	_	_		_	_	_	1275	-	_	_	-	_	-
Sílica	6-11	_	_	_	_	_	_	_	-	1277	_	_	_	_	_	i -
Feldspars	-							1)]	1
Barium	4-11	_	_	_	_		_	1205	_		1207	_	_	_		_
Calcium	4-11] -	1235	_				
Lithium	4-11	-	_		_]	1266	-	1270	_	_		_	
	4-11	1		•	1			;	1200	l	1283	ì	ì		•	
Lithium-potassium		-	-	_	-	-	-	-	-	-	1326	-	-	Į.	-	
Sodium	4-11	-	-	-	-	-	•	-	-	-	1330	-	-	-	-	-
Sodium-potassium	4-11	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Strontium	4-11	-	-	-	-	-	-	-	-	-	1334	-	-	-	-	-
Ferramic E	4-11	-	-	-	-	-	-	1093	-	-	-	¦ -	-	-	-	-
Ferroferric oride + Iron(ic) oxide	4-3	_	_		_	İ _		_	_	_		_	715		_	
Fiber cermets	6-11	928	_					_				_			_	
	6-11	_				_		_	_	1269				_	_	_
Fiberfrax paper -tantalum shield- graphite fibers composite		_			}											
system	6-II	-	-	-	-	-	- 1	i -	1285	-	-	-	-	-	-	-
Fiberite 4030-190	e-11	-	-	-	-	-	1103	-	-	-	-	-	-	i -	-	-
Firebricks	1		1		j	i	l	1			1	1	1	1		
Alumina	4-I	-	-	-	i -	-	613	-	621	-	-	-	-	-	-	-
ASIM group no. 16 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	! -	-	-
ASTM group no. 20 insulating	5	-	-	-	-	i -	-	-	1031	-	-	-	-	-	-	-
ASTM group no. 23 insulating	5	- '	i -	-	-	-	-	-	1031	-	-	-	-	i _	-	-
ASTM group no. 26 insulating	5	-	-	-	-	-	-	-	1031	-	-	-	-	۱ -	-	-
ASTM group no. 28 insulating	ŧ.	-	-	-	-	-	-	 -	1031	-	-	-	-	-	-	-
ASTM group no. 30 insulating	5	-	-	-	-	-	-		1031	-	-	-	-	-	-	-
Egyptian		-	-	-	-	-	-	-	798	500	-	-	-	-	-	-
Firebricks	2	-	-	-	-	-	-	-	798	789.	-	-	-	-	-	-
K-28 insulating	5	_	-	١.	_	_	 	_	1031	509	_	_	-	_	-	
Siliceous	5	۱.	_		۱ ـ	-] _] .	i -	-	-	i -	12+3	-	-	_
		<u> </u>														

Material Name	Volume	Density	Lielting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductiv ty	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Flint container glass	4-11	-	i -	-	-	-	-	-	-	_	_	_	1799	1801	1729	
Flint glass	4-11	-	-	\	-	-	-	1829	-	-	-	_	_	-		-
Fluorothene	6-11	1030	-	-	-	-	-	_	i -	-	1045	_	_	_	_ ا	_
FM-5064 graphite-phenolic laminates			ĺ				Í								Ì	
P	6-II 4-II	- 1285	- 1285	-	-	-	-	1140	-	-	-	-	-	-	-	-
Forsterite 243	4-II	1285	1285	-	-	- 	1287	-	1291	-	- 1	-	-	-	-	-
Forsterite-stainless steel	7-11	1203	1203	-	-	-	-	-	-	-	-	-	-	-	-	-
laminates	6-11	-	-	-	- 1	-	-	-	1221	_	_	_	_	_	_	_
Fortical 28227	6-II	-	-	-	-	-	-	-	-	_	944	-	-	-	_	_
Fortical 28235	6-11	-	-	- 1	-	-		ا -		-	944	-	-	-	_	_
Fresco PR0920	6-11	-	-	-	-	-	-	1214	-	-	-	-	-	-	_	_
FRLG 2502-1	6-11	-	-	-	-	-	-	-	-	1277	-	-	-	-	_	_
Furfural formaldehyde, wo.d flour filled	6-11	-	-	-	-	-	-	-	-	-	1000	-	-	-	-	-
G																
	4-1	174	174	-	-	-	-	176	176	-	160	- [182	-	-	-
1	1	509	509	509	509	509	511	-	-	-	513	-	-	-	-	-
Gadolinium + Tantalum	2-I	-	-	-	-	-	-	-	-	- j	190	-	-	-	-	-
Gadolinium borides						j	ĺ				- 1	i	İ			
GdB ₄	6-1	295	-	-	-	-	-	-	-	-	-	-	- 1	-	-	- 1
GdBg	6-1	295	296	-	-	-	300	-	-	-	-	-	-	-	-	-
C4C	_	294	- l					1	ł		ļ	- 1				
0.0	5	294	294	-	-	-	-	-	-	-	-	- j	-	-	-	-
Gadolinium-cobalt internetallics	,	254	- [-	- 1	-	-	-	-	-	-	-	-	-	-	-
care i	6-1	665	_	ı	I					- 1	- 1	i	ı			l
	6-1	665		[]	-	- i	- [-	-	-	-	-	-	-	-	-
	6-I	665	-		-	-		-	-	-	-	-	-	-	-	-
	6-1	665	_		-	[]	_	-		-	-	-	-	-	-	-
	6-1	665	_	_			_	_	_ [_			-	-	-	-
· ·	5-1	665	_ [_	_	_	_	_	_	. i	-		-	_	-	-
	6-1	565	_	_	_	-	_	_	_		_	_			j	_ [
Gadolinium-copper intermetalics		Į	- 1				İ		İ	-	-		-	-	-	-
	6-3	665	-	_	-	-	_	-	_	_	_	_			_	
GdCu ₄	6-1	665	-	-	-	-	_ [_	_	_	-				-	
GdCa ₄	6-1	665	-	- 1	-	-	_	-	.	-	-	-			- 1	
Gadolinium ferrides		- 1	1	- 1		- 1	1		İ	- 1					_	Ţ
GdFe ₃	5-I	306	-	-	-	-	_	-	-	-	-	_	.	_	.	_]
GdFe ₄	6-1	30e	-	-	- !	-	-	-	-	1	-	_	- i	_		
GeFe _s	6-i	306	-	-	-	-	-	-	- 1	-	_	-	_	_	_	
Gd ₂ Fe ₃	E-1	306	-	-	-	-	-	-	-	-	_	- 1	.	- 1	_	_ [
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Material Name	Volume	Density	Multing Point	Heat of Fusion	Hoat of	Vaporization Heat of	Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittanco	Thermal Reflectance	Thormal Transnittance	Vapor Pressure
Gadolinium ferrides (cont.) Gd ₂ Fe ₁ Gadolinium (tri-)fluoride	6-II	306	-	-	-	T	-	-	-	-	_	_			FR	44	>
(GdF ₂) Gadolinium-gallium intermetal	5	-	407	-	-	.	-	-	-	-	-	-	_	_	-	-	-
lics (GdGs ₂) Gadolinium hydrides	6-1	665	-	-	-	-	-	-	-	-	-	.	_	_	_		
Gdī ₂	5	467	_	_	_						- 1	İ		_ [-	-	-
GdH ₃	5	467	-	-					-	-	-	-	-	-	-	-	_
Gadolinium-nickel intermetallics	i		ļ					-	-	-	-	-	-	-	- j	-	-
	6-1	665	-	-	_	-		-	-	_	. 1				- 1		
Cavi	5-1	665	-	-	-	-		-	-	-	- 1		-	-	-	-	-
Carri	- 1	665	-	-	-	-		-	-	-	-	-	- 1	1		-	-
Cdvi	- 1	665	-	-	-	-		-	- j	-	-	-	-		- 1	- 1	-
Care	_	665 665		-	-	-		-	-	-	-	-	-	-	- 1		
0.4 10/	-	565	-	-	_	-		-	- [-	-	-	-	-	-	- 1	_
CAN		665	-	_	_	-		-	-	-	-	-	-	-	-	-	-
Gd ₂ Ni ₂ 6	1	65	-	-	_	-	1:		-	-	-	-	- !	-	-	-	-
Gadolinium-osmium intermetal- lics (Gd ₂ Os ₂)	-					_			-	-	-	-	-	-	· ¦	-	- [
Cadelinium!	1 1	55	-	-	-	-	-	. .	- 1	-	-		_			- 1	
Gadolinium selenides	1 1	74	174	-	-	-	-	17	76 :	178	- 1	150	- 1	- I	-	-	-
GdSe 6-	, ,	65						-			i				-	-	-
GG;Se; 6-	- I -	65	-	-	-	-	-	-	.	-	-	-	-	_	_	_	- 1
Gd ₂ Se ₄ 6-		65	-	-	-	-	-	i -	.	-	-	-	-	-	- [_	
Gadolinium silicides (GdSi ₂) 6-	- 1	23			-	-	-	_	٠	-	-	-	-	- İ	-	-	
Gadolinium-silver intermetallies			_	-	-	-	52	' -	1	-	-	-	- .	-	-	-	- 1
Gadolinium sulfides	I 6	.5	-	-	-	-	-	-	j	-	-		ļ				
CAS	1.	i	į		ı				-	- 1		" "	- '	· ·	-	-	-
Gd ₂ S ₃ 5	73	- 1	-	-	-	-	-	-		-	-	- .	- 1	_	- 1
Gadolinium tellurides	1 "	7 [۲	32	-	-	-	-	-		-	- .	- .	- -	. .	.]		
Gd ₂ Te6-1	-	1.	.										1				_
Gd ₂ Te ₃ 6-1	1		.			-	639	i	1.	- -	- -	- -	- -	. -
Gadelinium	1					-	639	-	.	- ·	- -	• •	· -	٠ -	٠ -	- 1	-
intermetallics (Gd _{1-x} Y _x Co ₃) . 6-1 Galena	1	5 -	٠	-	-	-	-	-	Ι.	. .	. i .	.	ı	-		-	
	! -	-	• •	-	-	-	-	-	.	. .			ļ -	65	. -	٠ -	-
Gallium antimonide (GaSb) 6-2 Gallium arsenide (GaAs) 6-1	-	-	1	-	-	-	51	53	-	. -	-	1	-	03	' -	-	
Gallium (sesqui-) oxide (Ga ₂ O ₂) . 4-1	-	-	'	- 1	-	-	-	53	-	8	5 _	-		1.	-	-	Į
Sallium phosphid: (GaP) 5	1 -	['	- 1	-	-	-	184	-	· -	-	-	-	-			
Gallium telluride (Ga ₂ Te ₃) 6-1	-			1		-	-	520	-	-	-	-	-	-	-		i
ichkraite 4-II	1			- -		-	-	574	-	-	-	-	-	-	-	-	
	i	-			.	- [-	1233	-	-	123	5	-	-	1 _	_	1

Material Name	Volume	Denaity	Melting Point	Heat of Fusion	lient of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	The mai Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
German Flake	1	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-
	2-11	841	-	-	-	-	-	-	645	-	-	-	-	-	-	-
Germanium (Ge)	1	53.5	515	515	515	515	517	519	521	S24	526	-	525- 530	-	-	532
Germanium + Silicon	2-I	192	-	-	-	-	134	-	-	-	-	-	-	-	-	-
Germanium bismuth telluride (Ge _{1-x} Bi _x Te)	6-1	-	-	_	-	-	582	_	584	-	-	-	-	-	-	-
Germanium (di-)oxide (GeO ₂) .	4-1	-	_	_	_	_	_	186	_	_	182	-	_	_	_	196
· ·	4-E	1637	_	_	-	-	-	1639	_	_ [_	_	-	_	-	-
Germanium silicide (GeSi)	6-I	-	_	_	-	-	-	405	_	-	_	_	_	-	_	-
Germanium telluride (GeTe)	6-1	_	_	-	-	_	576	_	578	_	_	_	-	-	_	586
Germanium telluride + Silver antimony telluride	6-I	-	-	-	-	-	715	-	-	-	-	-	-	-	-	-
Glasses (see individual glasses)																
Glass ceramics (ⅇ also pyroceram)	4-II	-	-	-	-	-	-	1567	1589	1591	-	-	1593- 1599	1601	1603	-
Glucina	4-1	-	-	-	-	-	57	-	-	-	-	-	-	-	-	-
GMGA 5003 silicome	6-II	-	-	-	-	-	1070	-	-	-	-	-	-		-	-
Gold (Au)	1	534	534	-	-	534	536	538	540	-	542	544- 546	548	550- 552	-	554
Gold coating on titanium	6-11	-	-	-	-	-	-	-	-	-	-	-	1303	1.3 0 5	-	-
Gold costing on mylar	6-11	-	-	-	-	-	-	-	-	Ì -	-	-	-	1307	_	-
Gold + Cadmium	2-I	196	196	196	-	-	159	-	-	-	_	-	-	-	-	290
Gold + Cobalt	2-1	-	-	-	-	-	202	-	-	-	-	-	-	-	-	-
Gold + Cobalt + EX;	2-II	-	1012	-	-	-	1014	-	-	-	-	-	-	-	-	-
1	2- I	-	-	-	-	-	-	204	-	-	296	-	-		-	-
Gold + Copper + ΣX_1	n	-	-	-	-	-	1916	-	-	-	-	-	-	-	-	-
Gold + Iron	2-1	205	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gold + Manganese	2-1	210	-	- '	-	-	212	-	-	-	-	-	- 1	-	-	
Gold + Nickel	2- I	214	-	-	-	-	-	216	-	-	-	-	-	-	-	-
Gold + Palladium	2-I	-	-	-	j -	-	218	-	-	-	220	-	-	-	-	-
Gold + Paliadium + EX	2- I i	-	1019	-	-	-	1929	-	-	-	-	-	-	-	-	-
Gold + Platinum	2- I	-	-	- '	ļ - ·	-	222	-	} -	-	-	-	-	-	-	-
Gold + Silver	2-1	j -	-	-	-	-	-	-	-	-	224	-	226	-	-	228
Gold + Uranium	2-i	230	-	-		-	-	-	•	-	-	-	-	-	-	-
Gold + Zine	2- I	-	232	232	-	-	-	-	-	-	-	-	-	234	-	-
Gold alloy (special designations)		j I]	l I			•	Ì								
Palau	2-1	-	-	-	-	-	-	-] -	-	250	-	-	-	-	-
į · • ·	6-1] [-	-	-	-	-	645	-	-	-	-	-	-	-	-	-
,	6-1	_	653	-	-	- 1	-	-	-	-	-	-	-	-	-	-
Gold-zirconium intermetallics (Au-Zr)	6-1	-	653	-	-	-	-	-	-		-	-	-	-	-	-

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Material Name	Volume	Denaity	Maiting Poted	lient of Fusion	itent of Vaporization	Heat of Bublimation	Electrical Registivity	Specific tinat	Thermal Conductivity	Th-rn-al Differsivity	Thermal Lin Expansion	Thermal Absorpance	The rmal Emiliance	Thormal Rollectance	Thermal Transmittings	Vapor Pressure
								2	£3							- 3
Goodyear fram-inclines	e-11	952	-	-	-	-	-	-	-	-	996	-	-	-	-	- 1
1	,	_	_	-	_	_	_	_	_	_	_	_	120	_		_
]													112			
	1	-	-	-	-	-	371	-	-	-	114	-	-	-	-	-
Grade 5:25	1	-	- i	-	-	-	371	-	-	-	116	-	-	-	-	-
Grase StAD	1	-	-	-	-	-	371	115	129	-	122	124	125- 125	13)	-	-
Grade 3459	1	-	-	-	-	-	37.1	-	-	-	135	~	-	-	-	-
Grade 7957	1	195	-	-	-	-	-	134	136	13°L	196	142	144- 166	145	-	-
Grade 7130	1	-	-	-	-	-	-	-	-	-	-	-	15A- 152	-	-	-
Grade AGEIT	1	-	-	-	-	-	-	-	154	-	_	-	-	-	-	- 1
Grade AGESP	1	-	-	-	-	-	-	-	-	-	-	-	156	155	-	-
Grade AGRT	1	-	-	-	-	-	371	-	-	-	-	-	-	-	-	-
Grae: AGOT	1	-	-	-	-	-	169	-	362	-	165	-	-	-	-	-
Grade AGOT-CSF	-	-	-	-	-	-	160	-	-	-	-	-	-	-	-	-
Crade AGGT-EC	1	-	-	-	-	-	169	-	-	-	-	-	-	-	-	- 1
Grade AGR	1	-	-	-	-	-	37.	-	-	-	167	-	-	-	-	-
Grade AGX	1	-	-	-	-	-	-	-	-	-	163	-	171	-	-	_
Grade ATJ	1	193	-	-	-	-	371	175	177	-	179	-	192- 195	19C	-	-
Grade ATL-92	1	-	-	-	-	-	-	-	192	-	194	-	-	-	-	-
Grade AUC	1	-	-	-	-	-	-	-	-	-	-	-	196- 196	290	-	-
Grade AWG	1	-	-	-	-	-	202	-	224	-	-	-	- 1	i - :	-	- 1
Grade CEP	1	-	-	-	-	-		-	-	-	206	-	-	- 1	-	-
Grade CFV	1	-	-	_	-	_	201	-	i -		219 212	-	-	-	-	
Grade CS	1	_	_		_	_	371	214	216	225	-	-	_	-	-	
Grade CSF	,	_	_		-	_	-		224	-	222	-	_	-	_	
Grade EM	1	-	_	-	_	_	271	-	-	-	224	_	_	_	_	_
Grade GBE	1	-	-	-	-	-	-	-	225	-	225	230	232- 234	236	-	-
Grade GBEI	1	195	-	-	-	-	-	238	240	-	342	244	265- 269	250	-	-
Grade H11M	1	-	-	-	-	-	-	-	-	-	-	-	252- 254	ļ -	-	-
Grade ESLM	1	-	-	-	-	-	371	-	-	-	256	-	256- 269	-	-	-
Grade H4LM	1	-	-	-	-	-	-	-	262	-	254	-	-	-	-	-
Grade MH4LM	1	-	-	-	-	-	-	-	266	-	-	-	-	-	<u> </u>	-
Grade NT-8605	1	-	-	-	-	-	371	-	-	İ	363	-	-	-	-	-
Grade X-0005	1	-	-	-	-	-	269	-	279	-		-	-	-	-	-
Grade 2-4025	2	-	-	- 1	-	-	-	-	212	-	-	-	-	-	j -	-
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Material Neme	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Swillmation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Fhe: mal Absorptance	Thermal Emittanse	Thermal Reflectunce	Thernal Tranemittance	Vapor Pressure
Graphites (special design.)(cont)						į					İ					
Grade RT-0003	1	.	-	-	-		-	-	274	- İ	-	-	-	-	-	-
Grade RVA	1	-	-	-	-	-	-	-	-	-	276	-	-	-	-	-
Grade RVC	1	-	-	-	-	-	-	-	-	-	278	-	-	-	-	-
Grade RVD	1	-	-	-	-	-	-		-	-	280	-	-	-	-	-
Grade SA-25	1	-	-	-	-	-	-	-	282	_	-	_	-	_	-	-
Grade SPF	1	-	-	-	-	-	-	-	-	-	-	-	284	286	-	-
Grade TS	1	- 1	-	-	-	_	- 1	-	-	-	288	_	-	_	-	-
Nuclear grade TSP	1	- [-	-	-	_	-	_	290	- 1	_	-	_	_	-	-
Grade TSX	1	-	-		-	-	-	-	-	_	292	-	-	_	-	-
Grade W	1	_	-	-	-	-	- 1	-	294	_	296	-	-	-	_	
Grade WSF	1	-		_	-	-	_	_	-	-	298	-	_	_	_	_ [
Grade ZT	1	-	-	_	_	-	200	_	302	_	-	_	Í - '	_	_	_
Grade ZT-5001	1	_	_	_	_	_	_	_	302	_	! -	_	_	-	_	_
Grade ZTA	1	-		-	-		-	_	_	-	305	-	-	-	-	
Grade ZTB	1	-	-	_	_	-	_	_	-	_	307	_	_	-	-	_
Grade ZIC	1	-	_	-	-	-	_	_	_ '	-	309	_	_	_	-	-
Grade ZTD	1	-	_	-	-	_	-	_	_	_	311	_	-	_	_	_
Grade ZTE	1	_	_	-	-	_	_	-	-	_	313	_	-		_	-
Gende ZTF	1	-	-	_	-	_	_	~	_	_	315	_	_] _	-	_
Graphites, others							ĺ		1			İ		İ		
Artificial grades	1	-	-	-	-	-	-	-	360	-	363	۱.	-	-	-	-
Carbon impregnated	1	-	-	-	-	-	-	-	358	_	_	_	-	_	۱ -	-
Ceylon graphite	1	_	-	-	-	-	352	-	354	-	356	۱ -	_	-		_
Coated with grade W graphite.	1	-	-	-	-	-	-	-	294	-	296	-	-	-	-	_
Coated with silicon carbide .	1	-	-	-	l _	-	- 1	_	_	-	-	-	386	_	_	-
Cumberland graphite	1	_	_	-	-	-	352	_	354	l <u>-</u>	_ '	_	_	_	_	i
Electrode	1	_	_	_	ı -	_	_	_	360	_	_	-	365	_	-	_
Experimental grades	1	_	_ '	-	-	-	337	_	339	343	349	_	_	_	-	_
Flake	ı	-	_	-	-	-		-	-	-	369	-		¦	j	_
Great Lakes base stock grades	1	-	-	-	-	_	_	-	_	-	381	_	-	-	_	_
Great Lakes end-cap grades	1	_	-	۱ -	i -	-	.	_	_]_	381	-	-	_	_	_
Great Lakes impervious							1		-	Ì						
grades	1	-		-	-	-	-	-	-	-	351	-	-	-	-	-
Hilger H.S. grade	1	-	-	ļ -	-	-	332	-	354	-	-	-	-	-	-	-
Karbate	1	-	-	-	-	-	-		358	-	-	-	-	-	-	-
Lampblack-base	1	-	-	-	-	-	<u>i</u> -	-	367	-	-	-	-	-	-	-
	1	-	-	-	-	-	352	-	354		-	-	-	-	-	-
Pyrolytic	1	-	-	-	-	-	! -		317	-	319	-	325- 331	333- 235	-	-
Pyrolytic coating on tentalum.	6 -11	-	_	 -	-	-	-	-	-	-	-	-	373- 575	1	-	-
P-rolytic, nucleated and	 				}					1					1	
regenerative	1	-		-	-	-	-	-	-	-	319	j -	-	-	-	-
Silicon carbide bonded	1	i -	-	-	-	-	-	-	-	-	-	-	386	-	-	-

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Graphites, others (cont.)		_	-	-	-	-	-	-	-	-	-	-	-		-	_]
Unspecified grades	1	105	105	-	-	105	371	375	377	379	383	-	386- 388	-	-	390
Graphite + Silicon carbide	5	-	-	-	- ;	-	-	737	-	-	-	-	-	-	-	- 1
Graphite + Thorium (di-)oxide .	5	-	-	-	-	-	-	-	739	-	-	-	-	-	-	- [
Graphite + Uranium (di-)carbide	5	-	-	-	-	-	-	-	743	-	-	-	-	-	-	-
Graphite + Uranium (di -)oxide .	5	- [- [-	-	-	-	- 1	741	-	-	-	-	-	-	-
Graphite + Zirconium (pyro-) - carbide	5	-	-	-	-	~	-	-	-	-	745	-	-	-	-	-
Graphite fabric	6-11	-	-	-	-	-	-	-	-	1271	-	~	-	- :	-	-
Graphite cloth lamina! 's			1													
PT-0110	6-11	-]	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0111	6-II	-	-	-	-	-	j -	-	-	-	1227	-	-	-	-	-
PT-0113	6-11	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0114	6-11	-	-	-	- :	-	-	-	i -	-	1227	-	-	-	-	-
PT-0154	6-II	-	-	-	-	-	-	-	-	-	1227	-	-	-	-	-
PT-0156	6-II	-]	-	-	-] -	-	-	-	-	1227	-	-	-	-	~
Graphite fibers - tantalum shield composite system	6 -11	-	-	-	-	-	-	-	1281	-	-	-	-	-	-	-
Graphite-phenolic laminate FM-5064	6-11				}		1	1140		_				l	°_	_
	3	-	-	-		-	-	1140	29-]	39		-	-	_	_
Gray cast iron		-	-	-	i -	-	-	-	33	-	35		-	-	"	
Gray cast iron, ferritic base	3	-	_	-	-	_	-	1 -	33	-	-	-	-	-	-	-
Gray cast iron, pearlific base .	3	-	-	-	-	-	-	-	31	-	-	-	-	-	-	-
н																
Hafnia	4-1	192	192	-	-	-	194	196	198	-	200	-	202	-	-	204
Hafnium (Hf)	1	556	556	-	-	l -	558	560	-	-	562	-	-	-	-	-
Hafnium + Zirconium	2-1	236	236	-	-	-	238	240	242	-	244	} -	-	-	-	246
Hafnium antimonide (HfSb)	6-1	-	-	-		-	55	-	-	-	-	-	-	-	-	-
Hafnlum beryllide (Hf ₂ Be ₂₁)	6-1	-	- 1	-	-	-	-	98	-	-	100	-	-	-] -] -]
Hafmum (di-)boride (HfB2)	6 - I	170	170	-	-	-	172	174	176	-	178	-	180	-	-	-
Hafnium carbide (HfC)	5	49	49	-	! -	-	51	53	55	57	59	-	61	-	-	-
Hafnium carbide + Zirconium cermet	6-II	-	-	_	-	-] -	-] _	-	852	_	-	-	-	-
Hafnium-chromium intermetallics (HfCr ₂)	6-1	-	683	-	-	-	} -	-	-	-	-	-	-	-	-	-
Hafnium-cobalt intermotallics (HfCo ₂)	6-1	-	683	-	-	_	_	_	_	-	_	_	_	_	_	_
Hafnium ferrides (HfFe ₂)	1	-	306	-	-	-	-	-	-	1 -	-	-	-	-	-	-
· Hafnium fluoride (HfF4)	1	_	-	-	! -	-	-	367	-	1 -	-	-	-	-	-	-
afnium germanide (HfGe)		-] -	-	-	-	325	-	1 -	-	-	-	} -	-	1 -	-
Hafnium-manganese intermetal- lics (HfMn ₂)	6-1	-	683	-	-	-	-	-	-	-	 -	-	-	-	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Preletivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Hafnium-molybdenum inter- metallics (HfMo ₂)	6-1	_	684	_	_	_			_							
Hafnium-nickel intermetallics									_	_	-	_	_	_	-	-
(HfNi ₂) Hafnium nitride (HfN)	6-I 5	517	684 517	-	-	i - I -	- 519	521	- 523	-	- 525	-	- 527	-	-	- 531
Hafnium (di-)oxide (HfO ₂)	١.,	192	100										529		_	
Hafnium (di-)oxide coating cu tungsten	4-! 6-II	192	192	-	-	-	194	196	198	-	200	-	202 1377 -	-	- -	204
Hafnium (di-)oxide + ΣX_i	4-1	-	_	_	_	_		۱.		_	711	_	1379	_	_	_
Hafnium (di-)oxide + Calcium oxide	4-I	-	_	_	_	_	_	_	_	_	701	_	_	_	_	_
Hafnium 1di-) oxide + Magnesium oxide	4-I	_	_	_	_		_		_		703		-	-	_	-
Hefnium (di-)oxide + Tautalum (pent-)oxide	4-1	_		_		-	-	-		-		-	-	-	-	-
Hafnium (di-)oxide + Titanium (di-)oxide	4-1		-	_	-	-	-	-	-	-	705	-	-	-	-	-
Hafnium (di-)oxide + Titanium (di-)oxide + Zirconium	4-1	_	_	_	-	-	-	-	-	-	707	-	-	-	-	-
Hafnium sclenide (HfSe)	_] _	I	_	-	_	331	-	_	_	709	_	-	-	-	-
Hainium silicate (HiO2 · SiO2)	4-II	_	_	_	_	_	_	_	_	_	1241	[_		-	-
Hainium silicides	l											_	_	_	-	_
HfSi	6-1	-	524		-	-	_	-	-	_	_	_	_		_	_
HfSi ₂	6-1	523	_	-	_	_	_	i	.	_	_	_	_			
Hafnium tellurides (HfTe)	6-1	-	_	_	_	_	638	i _	_	_		_	_		_	
Hafnium-vanadium intermetallics (HfV ₂)	6-1	-	684	-	-	-	-	-	_	_	_	_	_			_
Hafnon	4-11	-	-	-	-	-	-	_	-	_	1241	-		_	_	_
Hamilton standard foam-inplace.	6-11	962	-	-	-	-	-	-	-	_]	966	-	_	_	_	-
Hastelloy 25	2-II	-	-	-	-	-	-	-	-	- 1	898	_	_	_	_	-
Hastelloy 500	2-11	-	-	-	-	-	-	-	-	-	1154	-	-	-	_	_
Hastelloy A	2-11	-	-	-	-	-	-	-	1261	-	-	_	_	_	-	_
Hastelloy B			1275	-	-	-	-	1273	1281	-	1287	1289	1293- 1295	1297	-	-
Hastelloy C			-	-	-	-	-	1130	1126	-	1166	-	-	-	-	-
Hastelloy C (AMS-5530)	2-11	1277	-	-	-	-	-	-	1281	-	1283	1289	1291- 1295	1297	-	- !
Hastelloy C (AMS-5530C)		-	-	-	-	-	-	-	-	-	-	1289	1293	1297	-	-
Hastelloy C coating on AISI 310 .		-	-	-	-	-	-	-	.	-	-	-	1337	-	-	-
	2-11	-	-	-	-	-	-	-	-	-	1301	-	-	-	-	-
Hastelloy F		-	-	-	-	-	-	-	-	-	1164	-	-	-	-	-
Hastelloy N			-	-	-	-	-	-	1281	- [1283	-	-	-	-	-
Hastelloy R-235	2-11	1122	-	-	-	-	-	1128	1136- 1138	-	1161	-	-	-	-	-

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Voporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal	Conductivity	Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Therma! Emistance	Thermal Reflectance	Transmittance		Vapor Pressure
Hastelloy X	. 2-11	1119, 1257	-	-	-	-	-	-	113	4,	-	1164	-	1172.	1,703	-	Т	<u>></u> _
Hastelloy X coating on AISI 310 .	6-II	-	-	_	١.	_	_	1	126	1	- 1	- 1		1189				
Hematite	4-1	-	-	١.	_	_	214	-	. -	-	- i	-	-	1339	-	-	.	-
Hidurel 6	2-11	-	_	i	_	_	962	219	- I		-	225.	-	-	224	-	-	-
Holmia	4-1	-	_	_	_	_	902	-	96	-	-	-	-	-	-	-	-	
Holmium (Ho)	1	564	564	564	564	564		206	3 -	i	-	208	-	-	-	~	-	
Holmium borides				"	304	301	566	-	-		- [-	-	-	-	-	-	
НоВ₄	6-1	295	_	_				l		i		ļ	ı	- 1			1	
HoB _€	6-I	295	_	-	-	-	-	-	-		-	-	-	-	-	_	1 -	
Holmium carbides			-	-	-	-	-	-	-	-	-	-	-	-	- İ	-	_	
HoC ₂	5	294	_					ĺ	İ		ı		l				1	
Ho ₂ C ₃	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	١.	1
Holmium-cobalt intermetallics		254	-	-	-	-	-	-	-	-	.	-	-	-	-	_	۱.	- 1
HoCo ₂	6-1		ı	l								- 1		- [- 1		l	ı
HoCo.	1 - 1	680	-	-	-	-	-	-	-	! -		-	-	- 1	_	_	_	- 1
Holmium ferrides	6-1	680	-	-	-	-	-	-	-	-		-	-	-	_		-	-
HoFe.	 		- 1	ł	1	- 1	ĺ						- 1			_	-	-
HoFe,	6-1	306	-	-	- 1	-	- i	-	-	-		_	_	_	_			ļ
Holmium-gallium intermetallics	6-1	306	-	- [-	- j	-	-	-	-		-	_	_ [Ī	-	-	1
(HoGa ₂)	6-1	680	- 1			- 1	- 1		l	1		ı		-	-	-	-	
Holmium-manganese interme- tallics			-	-	-	-	-	-	j -	-		-	-	-	-	-	-	
HoMn ₂	6-1	680	_	_		j	- 1		•	1					İ			
	i 1	680	_			- !	-	-	-	-	ļ	-	-	-	-	-	-	ı
Holmium-nickel intermetallics		1			-	i	-	-	-	-		- [-	-	-	-	-	ı
HoNi ₂	6-I	680		_	-	i			1							- 1		ı
HoNi _s		680	-	I	-	-	-	- j	-	-		-	-	-	-	-	_	
Holmium autila esta a s	4-1		-	-	-	-	-	- j	-	-		-	-	-	-	-	_	I
Honeycomos		-	-	-	-	-	-	206	-	-	2	208	-	-	-	_	_	ı
17–7PH stainless steel skin and cur	6-II					ļ			į									
2024 T-3 aluminum alloy skin and core	6-11	-	-					236	1230	-		34	-	-	-	•	-	
2024 T-3 aluminum alloy skin and alkyd isocyanate foam core				j					1230	-	12	32	-	-	-	-	-	
2024 T-3 aluminum alloy skin	5 -11	-	-	-	-	-	- 1	236	1239	-	12	43 .	. .	_	_	_		
	5-II	_	_	_					- 1				-	- 1		-	-	
Wotel alt 1		- 1	_	- 1	Į	- 1	i	- 1	1239	-	124	61 -	• •	-	-	-	_	l
		_ `	-	-	-	- ·	- 1	236	1230	-	12:		. .	-	-	-	_	ı
Plastic and metal composites 6	-11	- .	-	- [_ .	. .		236			123	- 1			ı			
Plantin ship 1				ļ		· '	- "	₩ .	1239	-	124 124		٠ -	- -	-	-	-	
Plastic skin and plastic core.	-11	- ·	-	-	- .	- -			1247- 1253	-	-	-	· -	. .	-	-	-	
									1203	į							_	

Material Name	Volvme	Denaity	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Registivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Honeycombs (cont.) Polyester P-43 resin skin				-												
and 2024 T-3 aluminum alloy core	6-U	-	-	-	-	-	-	1236	1239	-	1245	-	-	-	-	-
and polyester honeycomb core	6-11	-	-	-	-	-	-	1236	-	-	-	-	-	-	-	-
Polyester resin skin and epoxy resin core	6-11	-	-	-	-	-	-	-	1247	-	-	-	-	-	-	-
Polyester resin skin and phenolic resin core	6-11	-	-	-	-	-	l 1 -	-	1247	-	-	-	-	-	-	
Polyester Vibrin 135 and 181 fabric faces and phenolic core	6-11	-	_	_	_	-	_	1236	-		-	-	-	_	-	-
TAC polyester Vibrin 135 and 131 fabric skin and alkyd						i										
isocyanate foam core	6-Д	-	-	-	-	-	-	-	-	-	1249	-	-	-	-	-
polyester core	6-II		- -	-	- -	-	-	-	1010	1082	1012	-	- -	-	- -	-
I																
Igelit-PCU	6-11	_	-	_	_	-	_	1078	1086	1082	_	-	_	_ '	-	-
Ilmenite	4-11	-	- 1	_	- '	_	1427	1429	_	-	1431	-	-	_ '	-	-
Incoloy	3	_	-	-	_	_	۱ -	383	!	-	-	_	-	- 1	_	_
Incoloy 713C · · · ·	2-11	-	-	_	-	-	i -	1126	1140	-	1152	- :	-	-	-	-
Incoloy 800	3	_	_	_	-	-	-	-	_	_	405	_	-	-	-	-
Incoloy 801	3	-	-	-	-	-	-	-	-	-	405	_		-	-	-
Incoloy 804	2-11	-	-	-	-	-	-	-	-	-	1164	-	-	-	-	-
Inecloy 825	2-11	-	-	-	-	-	-	-	-	-	1267		-	-	- 1	-
Incoloy 901	2-11	-	-	-	! -	-	-	1259	1261	-	ļ -	-	- 1	- '	-	-
Incoloy T	3	-	-	-	-	-	-	-	; -	j -	405	-	-	-	-	-
Inconel	2-11	1219	1119	-	-	-	1124	1128	1140, 1144, 1145	1148	1155, 1161	-	1172, 1177, 1191	-	-	-
Inconel coated with enamel Inconel coated with NBS coating	6-II	-	-	-	.	-	1151	-	-	-	-	-	-	-	-	-
A-416	6-II	-	-	-	-	-	-	-	-	-	-	-	1361- 1363	-	-	-
Incomel coated with NBS coating N-143	6-II	-	-	-	-	-	-	-	-	-	-	-	1353 - 1355	-	-	-
Inconel coated with nickel aluminides	6-II	-	-	-	-	-	-	-	-	-	-	-	1453- 1455	1457	-	-
Incomel coated with silicone	6-11	-	-	-	-	-	1495	-	-	-	-	-	-	-	-	-
Inconel coated with zirconium	6-11	į į	-	-	-	-	-	-	-	-	-	-	-	1397	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	lfeat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Einittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Inconel 600	2-11	1219, 1307	-	-	-	-	-	-	1223, 1313	-	1158	-	-	-	-	-
Inconel 604	2-11	-]	-]	-	-	-	-	-	-	-	2158	-	-	-	-	-
Inconel 625	2-11	-	-	-	-	-	-	-	-	-	1166	-	-	-	-	-
Inconel 700	2-11	-	-	-	-	-	-	-	1223	-	1227	-	-	-	-	- 1
Inconel 702	2-11	-	1119	-	-	-	-	1128	1144	-	1152	-	1193	1205	- [-
Incozel 718	2 -II	-	-	-	-	-	-	-	-	-	1164	-	-	-	-	-
Inconel 721	2-11	-	-	-	-	-	-	-	-		1158	-	-	-	_	-
Inconel 722	2-11	-	- 1	-	-	-	-	-	-	- 1	1158	- 1	-	_	-	- 1
Inconel B	2-II	-	-	-	-	_	_	- 1	-	-	-	- 1	1174	_	-	- 1
Inconel M	2 -II	-	-	_	_	-	-	_	-	-	1158	-	_	-	_	_
Inconel W	2-11	_	-	_		_	_	_	_	_	1158	ا ـ ا	_	_	_	_
Inconel X	2 -1 1	1119	1119	-	-	-	1124	1128	1140	1148	1158	-	1172, 1177, 1186, 1195	1207	-	-
carbide	6-II	-	-	-	-	-	-	-	-	-	-	-	1403	1405	_	-
Inconel X coated with nickel- chromium alloy	6-II		-	-	-	-	-	-	-	-	-	-	1333	1335	-	-
Inconel X coated with tantalum carbide	6 -1 1	-	-	-	-		-	-	-	-	-	-	1417	1419	_	-
Inconel X coated with tungsten .	6-11	-	- 1	_	-	-	-	-	-	-	-	-	1329	1331	-	-
Inconel X coated with tungsten- cobalt alloy	6-II	~	-	-	~	-	-	-	_	-	-	-	1341	1343	-	
Inconel X coated with zirconium (di-)oxide	6-11	-	-	-	-	-	-	-	-	-	-	-	1399	1401	-	_
Inconel X 750	2-11	1122	-	-	-	-	-	-	1140		1158	-	-	-	-	-
Index rod (gas baked coke)	1	-	-	-	-	-	85	-	87	-	-	_	-	-	-	_
Indium antimonide (InSo)	6 - I	-	-	-	-	-	57	59	61	63	65	-	_	-	-	
Indium arsenide (InAs)	6-1	-	-	_	-	-	87	59	91	_	-		_	_		_
Indium bismuth selenide (InBiSe ₂)	6-1		-	-		-	333	-	-	-	-	-	-	-	-	_
"ndium (sesqui~)oxide (In ₂ O ₂)	6-I	-	-	-	-	-	-] -	-	_	210	-	-	-	-	-
Indium phosphide (InP)	5	-	-	-	-	-	631	633	-	_	-	_	_	_	_	-
Indium telluride (In ₂ Te ₃)	6-1	- 1	_	-	_	-	586	-	584	_	_	_	_	_	_	_
Inquartation silver		-	_	_	_	_	_	904		-	_	_	_	_		
Insulating bricks (see bricks)]							ļ
insulating firebricks (see firebricks)																
Insur.k C-T-601	6-II	1128	-	-	-	-	-	1142	-	-	-		-	-	-	-
Insurok XXX-T-640	6-II	1128	-		-	-	-	1142	-	j -	- :	-	-	-	-	-
Intermetallics (see each indivi- dual intermetallics)																
Inverse spinel	4-1	-	-	-	-	~	-	691- 693	-	-		-	-	-	-	- 1
Iodide titanium	1	-	993	-	-	-	996	99 9	1001	-	1005	-	-	-	-	1017
							L	<u> </u>	<u> </u>		<u> </u>	<u> </u>				

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Theymal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thormal Transmittance	Vapor Pressure
Iodide zirconium	1	-	1099	_	_	-	1102	1104	1106		1111	_	_	_	_	
Iridium (Ir)	1	568	568	-	-	568	570	572	574	-	-	_	576	_	_	_
Iridium + Rhodium	2-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	248
Iridium (tri-)silicide (IrSi)	6-I	-	-	-	-	-	407	-	-	-	-	-	-	-	-	-
Iron (Fe)	1	578	578	578	-	578	581	583	585	587	589	592	594-	602	-	604
Iron, Armeo	1	578	-	-	-	-	581	583	585	587	569	592	600 594, 598	602	-	-
Iron, electrolytic	1	-	578	-	-	578	581	583	_	_	589	_	-	_	_	604
Iron, Svea	1	-	-	-	-	-	_	-	585	_	_	-	-	_	_	-
Iron coated with chromium carbide – cobalt blend	_															
• • •	6-II 6-II	-	-	-	-	-	-	-	-	-	-	1407	1409	-	-	-
Iron coated with tungaten		_	-	-	-	-	-	-	-	-	-	1308	1311	-	-	-
Iron coated with tungsten carbide		_	_	-	-		-	_	-	-	-	1325	1327	-	-	-
Iron + ΣX _i	3	461	_	-	_		463	_	- 465	-	-	1421	1423	-	-	-
Lon + Aluminum + FX _i	3	45	-	-	-	-	47- 51	-	-	-	-	-	-	-	- -	- -
Iron + Carbon + $\sum X_i$ (C < 2.00).	3	-	-	-	-	3	5	7- 10	-	12- 14	16- 20	-	-	-	-	22
• • • • • • • • • • • • • • • • • • • •	3	27	-	-	-	-	-	-	29- 37	-	39- 41	-	-	-	-	-
Iron + Chromium + $\sum X_i$	3	55	53	-	-	-	57- 63	65- 77	79- 83	85- 94	96- 118	120	122- 134	136- 138	-	-
Iron + Chromium + Nickel + + ΣX _i	3	140,	140- 141	-	-	-	147-	155-	166-	182-	195-	229-	233-	274-	-	-
Iron + Cobalt + ΣX _i	3	-	-	-	-	-	15? 288- 290	164 292- 294	180 296	193 298	227 300	231	272	286 302	-	-
Iron + Copper + ΣX_i	3	-	_	_ !	_	_	304	306	308	_	_		- 1	l		
	3	310	-	-	-	-	312-	316-	325-	329-	335-	-	345-	349	-	_
Iron A Mahrhaman I Tay			- 1	l	l		314	323	327	333	343		347			
	3	-	-	-	-	-	-	-	351	-	353	-	-	-	-	-
	3	-	-	-	-	-	355	357- 359	361- 363	365	367- 377	-	-	-	-	-
Iron + Nickel + Chromium + + EX _i	3	379	-	-	-	-	381	.533	385- 393	395- 397	339-	-	409-	413	-	-
Iron + Platinum + ΣX_1	3	-	-	-	-	-	_	-	.393	397	107 415	_	421	_	إ	_ [
$\texttt{iron} + \texttt{Silicon} + \Sigma X_i \dots$		-	-	-	-	-	417- 419	421- 425	427- 437	-	429- 442	-	-	-	-	-
Iron + Tellurium + ΣX_i	3	-	-	-	-	-	-	446	-	-	-	_	-	.]	_	_
Iron + Titanium + $\sum X_i$		-	-	-	-	-	-	448	-	-	- !	-	-	_	- 1	_
Iron + Tungsten + $\sum X_i$		-	-	-	-	-	-	-	450	-	452	- İ	454	-	- İ	-
Iron + Vanadium + $\sum X_j$	3	-	-	-	-	-	436- 458	-	-	-	-	-	-	-	-	-
Iron alloys (see cast irons and steels for special design.)															İ	

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Material Name	Volume	Denairy	Melting Point	licat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal	Thermal Linear Expansion	Thermal Absorptance	Thermal Emiliance	Thermal Reflectance	Thermal	Vapur Pressure	
Iron aluminates								1					 		 ``	†	┪
FeQ-Al ₂ O ₃	4-11	-	! -	۱ ـ	١.	_	_	999	_					ļ	l	ļ	1
Fe ₂ O ₃ · 2 Ai ₂ O ₃	1-II		_	_	_		[333	1	-		-	ļ -	-	-	-	Ĭ
Iron beryllide (FeBe ₂)	6-1	_	158	_	_	_				-	1001	-	-	! -	-	-	ı
Iror borides			•		Ì		-	-	-	-	-	-	-	-	-	-	1
FcB	6-1	_	296	-	-	١.	_	_	١.	_							-
Fe₂B	6-1	-	296	-	-	-	_	_			-	_	_	-	-	-	į
Iron carbide (Fe ₂ C)	5	53	63	-	_		_	C5	_	_		-	i -	`	-	-	١
Iron chromites]					i					i	-	-	-	-	-	1
1	4-11	-	-	-	-	-	_ ا	1051	_	_	1053	_			l	1	1
		-	-	-	-	-	-	_	_	_	1053	_			-	-	۱
	4-II	-	-	-	-		-	1065	- 1	-	-	_				-	İ
Iron lead silicate glass	4-11	-	-	-	-	-	1737	-	-	_	_	_	_	_	-		ı
Iron-niobium intermetallics (Fe ₃ Nb ₃)	6-I	-	684	-	-	-	_	_	_	_	_			_	_	-	
lron nitride (Fe ₄ N)	5	- !	621	_	-	_		_	_		_	-	_	-	-	-	ı
Iron oxides		1		Ì							-	-	-	-	-	-	ı
FeO	4-I	-	-	-	-	_	_	216		- !	222	_				İ	
Fe ₂ O ₂	4-1	-	-	-	-	-	214	218	_	_ [222	_	-	224	-	-	ı
Fe ₂ O ₄	4-1	212	212	-	-	-	_	220	_	_	_	-	_	224	-	! - !	ı
Iron(ic) exide coating on Haynes alloy no. 25 (L-605)	6-11	-	-	-	-	-	-	-	-	_	-	-	1381-	-	-	-	
Iron(ic) oxide + Aluminum oxide	4-1	-	_	_	_	_	-		_	_	713		1383				
Iron(ic) oxide + Magnesium oxide	4-1	-	-	_	_		_	_	_	-	717	-	-	-	-	-	
lron(ic) oxide + Silicon (di-) oxide	4-1	_		_				719	-	-	"	-	-	-	-	-	İ
1	4-1	_	_	_	_ [-	-	1	-	-		-	-	-	-	-	ı
Irvn(ous,ic) oxide + Iron;ic) oxide				Ì	_	-	-	-	-	-	721	-	-	-	-	-	
Iron phosphites			Ĭ	- 1	- i	- [-	-	-	-	-	-	715	-	-	-	
Fe ₂ P	5	_	635	_	_	_	I	1	[- 1		I	- 1	1			ı
1 1	5	_ !	635	-	_ [- 1	_	-	-	-	-	-	-	-	-	-	1
Iron selenides	-	- !		- 1	_	-	-	-	-	-	-	-	-	-	-	-	
FeSe	6-1	-	-	_	_	_	-	335	_	_		J		i			1
FeSe ₂ 6	5-1	-	-	-	-	-	-	335	- 1			-	-	-	-	•	
	5-1	-	-	-	-	-	_	335	_	_			-	-	- 1	-	
	5-1	-	-	-	-!	-	-	335	_	_	-		-	- j	-	-	
Iron (ortho-) silicate (2 FeO · SiO ₂) 4	-11	-	-	_	_			1243	_	_ ,	245	_		-	-	-	
Iron silicides FeSi s							ĺ		-	-	243	-	-	-	-	-	
			409	-	-	-	411	-	-	-	413	-	-	-	-	-	
6	- ∓	-	409	-	-	-	-	-	-	-	413	-	-	-	-	-	l
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Variorization	Hat of Sublimation	Electrical Registivity	pecific Heat	Thermul Conductivity	Thermal Diffuelvity	Thermal Linear Expansion	Thermal Absorpance	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
lron silicides (cont.)						İ				! 						
FegSi	6-1	-	409	-	-	-	-	-	-	-	413	-	-	-	-	-
Fe ₃ Si ₂	5-1	-	409	-	i -	-	-	-	-	-	-	-	-	-	i -	-
FeS	_	•	l		l											
FeS ₂	5 5	-	-	-	-	-	-	650	-	i - I	-	-	-	-	-	-
Iron tellurides		_	-	-	-	-	-	690	-	-	-	•	-	682	-	-
FeTe	6-1	_	_	_		ı		596								
FeTe ₂	6- i	_		· -		_	-	530	-	-	- 592	-	-	-	-	-
Iron titanate (FeO·TiO ₂)	4-11	_	1425	1425	_	_	1427	1429	-	-	392 J431	- 1	-	-	-	-
Iron titanate coating on niobium-						-			-	-		-	-	-	-	-
zirconium alloys	6-11	-	-	-	-	-	-	-	-	-	-	-	1355	-	-	-
Iron-zirconium intermetatlics											İ					
1 1	6- i	-	684	-	-	-	-		-	-	-	-	-	-	-	-
Isobutylene and isoprene	6-1	-	664	-	-	-	-	-	-	-	-	-	-	-	-	-
copolymer	5-11	-	-	_	-	_	-	_	_	.ú32	_ i		_	_		
isocyanate polyester elastomer .	S-11	96C	-	-	-	-	_	_ [_	_	_	-	_	_		_
Is foam	6-11	962	- [-	-	-	-	_	_	_	966	_	_			_
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i i	6-II	1030	-	-	-	-	-	-	1037	-	1045	-	-	-	-	-
Kennemetals 3047	_			j		i						I	i	- 1		
1	6-П	-	-	-	- j	-	-	-	-	-	934	-	-	-	-	-
	6-II	_ [-	-	-	-	-	-	-	-	934	-	-	-	-	-
	6-11	_ }	<u> </u>	-	-	-	-	-	-	-	934	-	-	-	-	-
	6-11	_	_	_	-	-	- 1		-	-	934	-	-	-	-	-
	5-II	-	-	_	_	- 1	-	_	859	-	954 885	-	-	- [-	-
	6-11	-	-	.	-	- 1	_	_	-	-	891	_		_ [
кш	6-11	-	-	-	-	- 1	-	_	-	-	885	_	-	- ;	_	
К5Н	6-II	-	-	-	-	-	-	-	-	- 1	895	_ [_		_]	_
	6-II	-	-	-	-	- [-	-	359	-	934	-	-	_	-	
1	6-II	- !	-	-	-	-	-	-	-	- [685	-	- 1	-	- !	- 1
	6-II	-	-	-	-	-	-	-	-	-	897	-	-	-	-	-
i i	6-11	-	-	- i	-	-	-	-	-	-	934	-	-	- İ	-	-
	2-1	-	-	-	-	-	-	-	-	-	565	-	-	-	-	-
	6-1	- [-	-	-	-	-	-	-	-	897	-	-	-	-	- [
i i	6-11	-	-	-	-	- j	-	-	-	-	883	-	-	-	-	-
1	6-II 6-II	-	-	-	-	-	-	-	-	-	885	-	-	-	-	-
1	6-II	_ 1	.	-	-	-	-	-	-	-	934	-	-	-	-	-
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Kenametals (cont.) K82	Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Offfuelvity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emiltanco	Thormal Reflectanco	Thormal Transmittanco	Vapor Pressure
K82	Cennametals (cont.)																
K84 6-II		6-11	_	_	_	_	_	_	J	_	_	85.1	_	_	_		_
K866 6-II		! i	ì														_
K90 6-II - - - - - - 903 - - -		- 1	_		-	1											_
K91 6-II 903		1 1	1														_
K92 6-II 903			- 1								i						_
K94 6-II 901		•															_
K95																	
K96 6-II 899 -		1 1												i			_
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Kennametal K-151A coating on AISI 310 6-II 1491 Kennametal K-162B coating on AISI 310 6-II 1493 Kennertium W-2 6-II 934 Kennertium W-10 6-II 934		1 1				l			l]	l	1		-
AISI 310		0-11	-	-	-	-	-	-	-	-	-	883	-	-	-	-	-
AISI 310		6-n	-	-	-	-	-	-	-	-	-	-	-	1491	_	_	-
Kennertium W-2 6-II 934		6.17												1407	l		
Kensertium W-10 6-E 934		1 (ì	i	İ		1		į	1	i	l	l		1
Kimble N-51A glass		1 1		!	1	į	l	1	l	-	1	1	1	-	Ì		-
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Laminate 4129 6-II			1136	_	_	_		_ ا	1144	_	_	-]	_	-	
Laminates Ceramic 6-II		1 1		_] _	_] _	<u>-</u>	_	_] _	965]]	-]
Ceramic 6-II 1225 1225 Graphite cloth 6-II 1227]	-	_	-	-		1	1	•		1	! - !]
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Material Name	Volume	Denasty	Molting Print	fest of Fusion	Fout of Vaporization	Hoat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Canductivity	Thermal Diffusivity	Thormal Linear Expansion	Thermal Absorptance	Thermal Zinittanse	Thermal Reflectines	Thermal Transmittance	Vapor Pressure
Laminairs (cont.)																
	6-11	-	-	-	-	-	-	1115- 1117	1120	1220	1122- 1124	-	-	-	-	-
Reinforced epoxy and plyophen copolymer resin	6-11		-	-	-	-	-	~	~	1218	-	-	-	-	-	
Reinforced copolymer of phenolic and epoxide resins .	6-1 <u>1</u>	-		-	-	-	-	-	-	-	1126	-	-		-	-
Reinforced melamine- formaldehyde resin	6-II	-	-	-	-	-	-	-	-	1128	-	-	-	-	-	-
Reinforced phenolic resin	6-11	1130	-	-	-	-	-	1132 1146	1149- 1156	1159- 1170. 1220	1172- 1179	-	•	-	-	-
Reinforced phenyl miane resin	6-II	-	-	-	-	-	-	1212	-	1220	-	-	-	-	_	-
Reinforced polyester resin	6-II	1150	-	~	-	-	-	1191	1155- 1195	1220	1200	-	-	-	-	-
Reinforced TAC polyecter resin	6- <u>1</u> 1	1150	-	-	-	-	-	1153	1155	1220	1157- 1159	-	-	-	-	-
Reinforced polytetralluoro- ethylene	6- 1 1	-	-	-	-	-	-	1214	1215	1222	_	-	-	-	-	-
Reinforced silicone resin	6-II	1204	-	-	-	-	-	1206	1205. 1215	1220	1290	-	-	-	-	-
Reinforced tellon	6- 11	-	-	-	-	-	-	1214	1215	1220	-	-	-	-	-	-
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i 1135P	1	-	-	-	-	-	-	-	-	-	-	-	191	133	-	-
RW Speidral II	1	-	-	- '	-	-	-	-	-	-	-	-	-	163	-	-
Lanthan	4-1	226	226	-	-	-	-	228	-	-	230	-	-	-	-	230
Lambasum (La)	1.	606	606	505	605	605	605	610	1	-	612	-	-	-	-	614
Lanthamm + Calcium	2-1	- 252	250	-	_	-	-	-	1	-	-	-	-	-	- 1	-
Lanthanum + Magnesium Lanthanum + Magnesium + EX; .	2-1	1	1922				_		1]		-	-	-	-	-
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Lanthanum aluminides LaA!	6-3	43	45	_ :	_	_	_	_	_	_	_	_	_ :	_	_	_
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Lanthaman antimonide																
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Lanthanun-bismuth intermetal- lies (LaBi)	6-1	667	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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:	iliterial Name	Volume	Denaity	Moliting Point	liest of Fusion	Heat of Valuerization	Heat of Rublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expunsion	Thermal Abbortance	Thormal Emittance	Thermal Reflectmos	Thermal Transmittance	Valve Pressure
Lanthamen !	orides				T		!	 	-						-=	F÷	
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Landanian	romide (LaBra)	5	11	1	1 -			369	- 1	-	-	362	-	-	-	-	-
lies	radiatum intermetal-							_	-	-	-	-	-	-	-	-	-
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	opper intermetallics	i						1	į	- 1	-	-	-	-	-	-	-
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LaCa		14	667	-	- 1	- 1	_		i	-	-	- [-	-	-	- 1	-
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Laufeaum fle	oride (LaF ₂) 5	.	-	807	-	-	- Ì	_		-	-	-	-	- [-	-	-
Landaninga (LaGo ₂)	llium informatallium			i	1		ı	-		-	- [- į	-	-	- 1	-	- i
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	The rmal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Taermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Lamhan.m-mercury intermetal- lics																
LaHg	6-I	667	-	-	-	-	-	_	_	-	_	_	_	_		
Lalig ₂	6-1	667	-	_	-	_	_	-	-	_	_	-		_	_	_
LaHg ₃	6-1	667	-	-	i - I	-	-	_	_	-	-	_	-	_	_	
Lanthanum-nickel intermetallics (LaNis)	6-1	667	-	-	_	_	-	_	_		_	_	_	_	_	_
Lanthanum nitride (LaN)	5	621	_	-	-	_		_	_	_	_	_	_	_	_	_
Lanthanum-osmium intermetal- lics (LaOs ₂)	6-1	667	_		_		_	_	_		_	_		_	_	
Lanthanum oxides										-	_	-	-	-	-	-
LaO	4-1	226	_	_	_	_	_	_	-	_		_	_	_		
La ₂ O ₂	4-I	226	226	_	_		_	228	_	_	230	_			•	
Lanthanum phosphide (LaP)	5	635	-	_	-		_	-		_	230	_	- i	-	-	232
Lanthanum selenides						į						_	_	_	_	-
LaSe	6-1	365	_	_	_	_		_	_	- 1	_	_	_	_	_	
La ₂ Se ₃	6-I	265	-	-	_	_	36''	_	_	_	_	_		_	_	
La _s se,	6-I	365	-	-	-	-	_	_	_	_	_				_	
Lanthanum silicides (LaSi2	6-I	415	415	-	-	-	527	_	_	_	417		_	_	_	
Lanthanum eil er intermetallics					ļ						•			_	_	
LaAg	6-1	667- 663	6v8	-	-	-	-	-	-	-	- 1		-	-	-	-
LaAg ₂	6 - I	667- 668	668	-	-	·	-	-	-	-	-	-	-	-	-	-
LaAg ₃	6-I	667 - 668	668	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanthanum stannides					İ	-			ĺ		i	ļ				
LaSn ₂	6-1	541	541	_ [_	_	-	_	_	_	_	_	.	_	_	
La₂Sn	6-I	-	541	_	_	_	_ !	_	_	_	_	_	_	_	_	
La ₂ Sn ₃	6-I	-	541	_	- i	_	-	_	_	_	_	_	_	_	_	
Lanthanum sulfides				i								-	;	1	_	
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LaS ₂	5	684	-	-	-	_ [-	_	_	- İ	_	_	_		_	
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ia ₅ S ₄	5	683	684 ;	-	_ !	-	-	-	-	- 1	_	_	-	-	_	_ [
Lanthanum elluride (La2Te3) .	6-1	- !	-	- }	-	- İ	638	-	-	-	-	-	_	_	- İ	_
Lanthanum-thallium intermetal- lics]		ļ									İ	
LaTı	6-1	-	669	-	-	-	-	-	.	-	-	- 1	-	-	_	.
LaT';	6-I	667	G69	-	-	-	-	-	-	-	-	-	-	_	_	_
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Lanthanum-zinc intermetailles		l			- 1	- 1					1	1	į		İ	
LaZn	6-1	667	-	-	-	-	-	-	- }	-	-	-	-	-	_	_
LaZn _s	ō-ĭ	667	-	-	-	-	-	.	- !	-	-	-	-	-	-	- 1

Material Name	Volune	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor ! ressure
Lanthanum-zinc intermetallics (cont.)			_													
LaZn ₃₁	6-1	667	-		-	-	-	-	-	-	-	-	-	-	-	-
Lawsonite	4-11	-	-	-	-	-	-	1233	-	-	-	-	-	-	-	-
Lead + Copper	2-1	254	-	-	-	-	-	-	-	-	256		-	-	-	-
Lead aluminate (PbO·Al ₂ O ₂)	4-11	-	-	-	-	-	-	-	-	-	1003	-	.	-	-	-
Lead borate glass	4-II	-	-	-	-	-	-	-	-	-	1615	_	-	-	-	-
Lead borosilicate glass	4-11	-	-	-	-	-	-	-	-	-	1717	-	-	-	-	-
Lead-barium magnesium aluminum silicate	4-11	-	-	-	-	-	-	-	-	-	1256- 1258	-	-	-	-	-
	4-11	-	- 1	-	-	-	-	-	-	-	1250	-	-	-	-	-
Lead germanium oxide (2 PbO·(ieO ₂)	4-11	-	-	-	-	-	-	-	-	-	1133	-	-	-	-	-
Lead germanium phos. 4 atc (5 PbO · CeO ₂ · P ₂ O ₅)	4-11	-	-	-	-	-	-	-	-	-	1175	•	-	-	-	-
Lead magnesium aluminum silicate	4-11	-	-	-	-	-	-	-	-	-	1252 - 1254	-	-	-	-	-
Lead molybdate (PbO2 · MoO2)	4-11	-	-	- ,	-	-	-	1113	-	-	1115	-	-	-	-	-
Lead (mon-)oxide (PbO)	4-1	-	-	-	-	-	-	234	-	-	-	-	-	-	-	-
Lead phosphates								<u> </u>								ĺ
PoO · P ₂ O ₅	4-11	-	-	-	-	-	-	-	-	-	1171	-	-		-	-
2 PbO · P ₂ O ₅	4-11	-	-	-	-	-	-	-	-	-	1171	-	-	١.	-	-
3 PbO · P ₂ O ₅	4-11	-	-	-	-	- '	-	-	-	-	1171	-	-	-	-	-
3 PbO · 2 P ₂ O ₅	4-11	-	-	-	-	-	-	-	_	_	1371	-	-	; i -	-	-
5 PbO - 2 P ₂ O ₅	4-11	-	-	-	-	-	-	-] _	_	1171	_	-	_	- 1	-
8 PbO · P ₂ O ₅	4-11	-	-	-	-	-	-	-	-	-	1171	-	-	-	-	-
Lead potassium silicate glass	4-11	-	-	-	-	-	۱ -	-	-	1749	-	-	-	-	-	-
Lead silicates							1	l						[1
PbO·SiO ₂	4-11	-	-	-	۱ -	-	ļ -] -	-	-	1247	-	-	-	-	-
2 PbO·SiO ₂	4-11	-	-	-	-	-	-	-	-	-	1247	-	-	-	-	-
4 PbO · SiC ₂	4-11	-	-	-	-	-	<u> </u>	-	-	-	1247	-	-	-	-	-
Lead silicate glass	4-11	_	-	-	-		1739] -	1741	-	-	-	1743	1745	1747	-
Lead silicon phosphate (5 PbO·SiO ₂ ·P ₂ O ₃)	4-11	-	-	-	_		_	-	-	-	1177	-	_	-	_	-
Lead strontium silicate glass	4-II	-	-	-	-	-	-	-	-	-	1751	! -	-	-	-	-
Lead sulfide (FoS)	5	-	-	-	-	-	-	-	-	-	-	} -	i -	688] - ˈ	-
Load telluride (PbTe)	6-1	-	-	-	-	-	594	-	554	-	- 1	-	-	١ -	ļ _ :	-
Lend telluride + Tin telluride	6-1	-	-	-	-	-	717	-	-	<u> </u>	-	-	-	-	-	-
Lead (meta-) tit nate (PbO · TiO ₂)	4-11] -	-	-	-	-	-	-	1403	-	1435	-	-	-	-	-
Lead tungstate (PbO·WO ₃)	4-0	-	-	-	-	-	-	1474	-	-	1476	-	-	-	-	-
Lead zir∞nate (PbO·ZrO₂) .	4-11	i -	-	i -	-	-	-	-	1510	-	-	-	-	-	-	-
Leonhardite	4-II	-	-	-	-	-] -	1233	i -	-	-	-	-	-	-	-
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Material Name	Volume	Density	Melting Point	Heat of I usion	Heat of Vaporization	ifest of Sublimation	Electric"! Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Th stmal Absorptance	Thermal Emittance	Thernal Reflectance	Thermal Transmittance	Vapor Pressure
Libbey-Owens-Ford ptate glass no. 9330	4-II	_	_		,	_	_	1791		-	_					
Lime	4-I	99	99	_	_	_	101	103	105	_	107	_		_	_	109
iame window glass	4-11		_	-	_	_	-	-	1831	_	-		_	-	_	_
Lithium + Sodium	2-I	- 1	_	_	_	_	_	_	-	258	_	-	_	_	_	_
Lithium aluminates	-									200						
	4-E	_]	_	_	_	_	_] _]	_	1005	_	_	_	_	_
Li ₂ O · 5 Al ₂ O ₃	4-11	_]	_	_	_	_	_	_	_	_	1005	-	_	_	_	_
Lithium aluminum borate glass .	4-11	_	_	_	_	-	_	_		_	1617	_	_	_	_	_
Lithium aluminum fluoride (LigAlFg)		_	_	_	-	-	_	377	_	_	_	-	_	-	_	_
Lithium aluminum silicate	1							1		•						
Li ₂ O · Al ₂ O ₂ · 3 SiO ₂	4-11	-	-	_	-	_	-	-	- '	-	1275	-	_	-	_ '	-
Li ₂ O · Al ₂ O ₃ · 2 SiO ₂		-	-		-	-	-	-	-	-	1268- 1270	-	-	-	-	-
Li ₂ O - 1, 08 Al ₂ O ₃ - 3, 5 SiO ₂	4-11	-	-	-	-	-	-	-	-	-	1268	-	-	-	-	-
Li ₂ O · Al ₂ O ₃ · 4 SiO ₂		-	-	-	-	-	-	-	-	-	1268- 1270	-	-	-	-	-
Li ₂ O · Al ₂ O ₃ · 6 SiO ₂	4-II	-	-	-	-	-	-	-	-	-	1268- 1270	-	-	-	-	-
Li ₂ O · Al ₂ O ₃ · 8 SiO ₂	4-II	-	-	-	-	-	-	-	-	-	1268, 1275	-	-	-	-	-
Li ₂ O·Al ₂ O ₂ ·10 SiO ₂	4-11	-	-	-	-	-	-	-	-	-	1275	ا -	-	-	-	
Lithium aluminum silicate + + Lead bisilicate	4-11	-	-	-	-	-	-	-	-	-	1566	_	-	-	-	
Lithium aluminum silicate + + Lead borate	4-11	-	-	-	-	-	-	-	-	-	1560	-	-	-	-	_
Lithium aluminum silicate + + L'thium aluminum germanium oxide	4-11	-	-	_	-	-	_	_	-	_	1568	-	-	-	-	-
Lithium aluminum silicate bodies barium modified	4-11	-	-	-	-	-	-	-	-	-	1277-	-	-	-	-	-
Lithium aluminum silicate glass.	4-II	-	-	-	-	-	-	-	-	-	1281 1757- 1759	-	-	-	-	-
Lithium beryll:um borate glass .	4-II	-	-	-	-	-	-	-	-	-	1619	-	-	-	-	-
Lithium beryllium fluoride (Li ₂ BeF ₄)	5	-	-	-	-	-	-	379	-	-	-	-	-	~	-	-
Lithium (meta-)borate (Li ₂ O·B ₂ O ₂)	4-11	-	-	-	-	1041	-	-	-	-	-	-	-	-	-	1043
Lithium borate glass	4-11	-	-	-	j -	-	1607	-	-	-	-	-	- ,	-	-	-
Lithium borosilicate glass	√-1 1	-	-	-	-	-	-	-	-	-	1719	-	-	-	-	-
Lithium calcium silicate glass .	4-11	-	-	-	-	-	-	! -	-	-	1761	-	-	-	-	-
Lithium carbide (Li ₄ C ₂)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithium chloride (LiCl and LigCl ₂)	5	317	317		317	317	-	-	-	-	-	-	-	-	-	319
Lathium cobait oxide (LI _X Co _{1-X} O)	4-11	-	-	-	ļ -	- 	1135	-	-	-	-	-	-	l l	-	-

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resir ivity	Specific Heat	Thermal Conductivity	Thermal Dif' ivity	Thermal Linear Expansion	Thermal Absorptance	íe.rmal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Lithium cobalt nickel oxide																
[Li _x (Co _y Ni _{1-y} ; _{1-x} O]	4-11	-	-	-	-	-	1137	-	1139	-	-	-	-	- 1	-	-
Lithium copper oxide (Li _X Cu _{1-X} O)	4-11	-	- (-	-	-	1141	-	1143	-	-	-	-	-	-	-
Lithium fluoride (LiF and Li ₂ F ₂)	5	365	369	369	369	369	-	-	371	-	-	-	-	373	-	375
Lithium fluoride * Potassium fluoride	5	-	-	-	-	-	-	409	-	-	-	-	-	-	-	-
Lithium germanium oxides		- 1														
$1i_2O \cdot GeO_2$	4-11	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
Li ₂ O · 7 GeO ₂	4-11	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
2 Li ₂ O · GéO ₂	4-11	-	-	-	-	-	-	-	-	-	1145	-	-	-	-	-
3 Li ₂ O · 2 GeO ₂	4-11	-	-	-	-	-	-	-	-	-	1145	-	-	-	~	-
3 Li ₂ C · 8 GeO ₂	4-11	-	-	-	-	-	-	-		-	1145	-	-	-	-	-
Lithium Lydride (LiH)	5	431	431	431	431	-	-	433	435	-	437	-	-	-	-	-
Lithium lead silicate glass	4-II	-	-	-	-	-	1763		-	-	-	-	-	-	-	-
Lithium-magnesium-barium silicate glass	4-11	-	-	-	-	-	1765		-	-	-	-	-	-	-	-
Lithium magnesium borate glass	4-11	-	-	-	-	-	-	-	-		1621	-	-	-	-	-
Lithium manganese oxide (Li _X Mn _{i-X} O)	4-11	_	_	-	-	-	1147	-	-	-	-	-	-	_	-	-
Lithium manganese selenide (Li _x Mn _{1-x} Se)	6-1	_	_	-	_	_	337	_	339	_	-			۰	_	_
Lithium nickel oxide (Li _X Ni _{1-X} O)	6-11		_	_	_	_	1149	_	1151	_		_		_	_	
Lithium nitride (Li ₂ N)	5	621	_	621	621	_	_				_ :			_	_	_
Lithium oxide (Li ₂ O)	4-1	236	236	236	236	236	_	238	_		_	-		_	_	240
Lithium potassium aluminum silicate	4-11	-	-	_	_	_	_	} _	-	_	1283	_	_	_	_	_
Lithium silicates								ļ		<u> </u>	i					1
Li ₂ O · 2 SiO ₂	4-11	-	-	-	-	-	-	-	-	i -	1260	-	-	-	-	
2 Li ₂ O · SiO ₂	4-11	-	-	-	-	-	-	-	-	-	1260	i -	-	-		-
Lithium silicate glass	4-11	-	i -	-	-	-	1753	-	-	-	1755	-	-	-	-	-
Lithium silicate - quartz body	4-11	-	-	-	-		-	-	-	-	1262- 1264	-	-	-	-	-
Lithium sodium silicate glass .	4-11	- 1	-	-	-	-	1767	-	_	İ -	-	-	-	-	-	-
Lithium titanate (Li ₂ O·TiO ₂)	4-11	-	-	- 1	-		-	1437	-	-	-	-	- 1	-	-	-
Lithium uranate (Li ₂ O·UO ₂)	4-11	-	1452	-	-	-	-	-	- 1	-	-	-	-	_	-	-
Lithium zinc ferrite (Li _X Zn ₄ , _{\$Fe_2, 1-xO₄)}	4-5	-	_	_	-	_	_	1101	-			_	 -	_	_	_
Lockfoam	6-II	i .	۱.	-		_	_	_	-	_	966	_	_ '	-	_	_
Lohm	2-I	-	-	-	-	۱ -	-	-	138	-	-	-	-	-	-	_
LT-1 Metamic cermet	6-11	731	-	} -	_	-	-) -	-	-	-	-	735	} _	-	} _
LT-1B Haynes cermet	6-II	-	-	-	-	-	-		! _	i -	739	-	747	-	-	_
LT-2 Haynes cermet			-	-		-	-			-	743	j -	745	۱ -	Ì-	-
Lucalox	4-3	-] -	-	-	-	-	Ì -	, 11	-	22	-	32	-	-] -
Lucise	6-11	1020	-	-	-	-	-	-	1024	-	-	-	-	-	-	-
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Material Name	Volume	Denaity	Molting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Therma) Emiltance	Thermal Reflectance	Thermal Transmittunce	Vapor Pressure
Magnesium alloys (special designation) (cont.)																
AZ-91C	2-11	-	-		-	-	1026	-	- 1	-	-	-	-	-	_]	- }
AZ-92A	2-II	-	-	-	-	-	1026	-	-	-	1035	-	-	-	- 1	- 1
DTD 356	2-11	-	- 1	-	-	-	-	-	1079	-	- 1	-	-	- 1)	- 1
DTD 360	2-II	-	-	-	-	-	-	-	1079	- 1	-	-	-	-	- Ì	-
ΕΚ-30	2-E	-	- 1	-	-	-	-	-	-		1081	-	-	-	-	-]
EK-30A	2-11	-	-	-	-	-	1071	-	-	-	-	-	-	-	-	-
EK-32A	2-1	-	-	-	-	-	-	-	-	-	1081	-	_	_	-	- 1
EK-33A	2-11	-	-	-	-	-	-	-	-	-	1091	-	-	-	-	-
EK-41	2-II	-	-	-	-	-	-	-	-	-	1051	-	-	_	-	-
EK-41A	2-1	-	-]	-	-	-	1073	-	-	_	-	-	-	-	-	-
EZ-33A	2-11	-	_	-	-	-	1075	-	-	_	1081	_	_	-	_	- 1
Н- 607	2-11	-	-	-	-	-	-	-	1067	-	-	_	_	-	-	- [
Н-509	2-II	-	-	-	-	-	-	-	1031	-	-	-	-	-	-	-
н-511	2-Ⅱ	-	-	-	-	-	-	-	1045, 1067	-	-	-	-	-	-	
н-612	2-II	-	-	-	-	-	-	-	1045	-	-	-	-	-	-	-
Н-817	2 -I I	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
нк-31	2-11	-	-	-	-	-	-	-	-	-	1059	-	-	-	-	-
нк-зіа	2-II	-	1047	1047	-	-	1049	1055	-	-	-	-	- 1	1961	-	-
нк-зіха	2-II	-	-	-	-	-	1049	-	-	-	1059	-	- 1	- 1	-	-
HM-21XA	2-II	-	1047	1(43	-	-	1951	1055	-	-	-	-		- '	-	-
нм-зіха	2-i	-	262	262	-	-	-	-	-	- '	-	-	-	-	-	-
	2-II	-	-	-	-	-	-	1077	-	-	-	-	-	-	-	-
Hydronalium 71	2-11	-	-	-	-	-	1026	-	1031	-	-	- 1	-	-		-
HZ-32A	2-11	-	-	-	- '	-	1053	-	-	-	-	-	-	-	-	-
HZ-32XA	2-11	-	-	-	- '	-	1053	-	-	-	1059	-	-	-	-	-
Magnox B	2-11	-	-	-	- '	-	-	-	1279	-	-	-	- '	-	-	-
MSR	2-∏	-	-	-	-	-	-	-	1079	-	-	-	-	-	-	-
R25	2-11	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
T26	2-11	-	-	-	-	-	-	-	1067	-	-	-	-	-	-	-
Z3Z	2-Ⅱ	-	-	-	-	-	-	-	1067	-	-	- :	-	-	- 1	- 1
ZK-60	2-11	-	1063	1063	-	-	-	-	-	-	-] - '	-	-	-	-
ZK-60A	2-11	-	-	-	-	-	-	1065	-	-	1069]	-	-	-	-
ZREO	2-11	-	- '	- '	-	-	-	-	1045	-	-	-	-	-	-	-
ZT1	2-11	- !	-	-	-	-	-	-	1057	-	-	-	 -	-	ì -	-
ZTY	2- 1 1	-	-	-	-	-	-	-	1057	-	-	-	 -	۱ -	-	-
Magnesium aluminate (MgO·Al ₂ O ₂)	4-11	1007	1007	-	-	-	1009	1011	1013	1015	1017	<u> </u> -	_	-	-	-
Magnesium aluminate + + Magnesium oxide	4-II	-	-	-	-	-	-	-	1520	-	1522	-	-	-	-	-

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Material Name	Volume	Denasty	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Theimal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Magnesium aluminate + Silicon (di-)oxide	4-11	-	-	-	-	,	-	-	1532	•	-	-	-	-	-	-
Magnesium aluminate + Sodium (mon-)oxide	4-11	-	-	_	-	-	-	1524	1526	1528	1530	-	-	-	-	-
Magnesium aluminate spinal	4-11	1007	1007	-	-	-	1009	1011	1013	1015	1017	_	-	-	-	-
Magnesium aluminate spinel with sodium (mon-)oxide	4-11	-	-	-	-	-	-	1524	1526	1528	1530	-	-	-	-	-
Magnesium aluminum borate giaas	4-11	-	-	-	-	-	-	-	-	-	.4623	-	-	-	-	-
Magnesium aluminum silicate (2 MgO-2 Al ₂ O ₃ -5 SiO ₂)	4-II	-	-	-	-	-	1299	1300	1302	-	1304- 1308	-	-	-	-	-
Magnesium aluminum silicate bodies	4-II	-	-	-	-	-	-	-	-	-	1310	-	-	-	-	-
Magnesium aluminum silicate glass	4-11	-	-	-	-	-	-	-	-	-	1769	-	-	-	-	-
Magnesium antimonide (Mg ₂ Sb ₂).	6-1	-	-	-	-	-	67	-	-	-	-	-	-	-	-	-
Magnesium barium cerium titanate [(Ba _{1-X-y} Mg _X Ce _y)O- TiO ₂]	4-II	-	-	-	-	,	1447	 -	-	-	-	-	-	-	-	-
Magnesium barium titanate	4-11	-	-	-	-	-	-	-	-	-	1445	-	-	-	-	-
Magnesium beryllium borate	4-II	~	-	-	-	-	_	-	_	-	1625	-	-	-	-	_
Magnesium borides	İ						İ		İ							
MgB₂	6-1	-	-	-	-	-	-	152	-	-	-	-	-	-	-	154
MgB ₄	6-1	- '	-	-	-	-	-	152	-	-	-	-	-	-	-	-
Magnesium-cadmium intermetal- lics																
MgCd	f-1	-	-	-	-	-	-	644	-	-	-	-	-	-	-	-
MgCd ₂	6-1	-	-	-	-	-	-	644	-	-	j -	-	-	-	-	-
Mg ₂ Cd	6-1	-	-	-	-	-	-	644	-	-	-	-	-	-	-	`
Magnesium carbonate (MgCO ₃) .	4-11	-	-	-	-	-	-	-	-	-	-	-	-	1047	-	-
Magnesium chloride (MgCl ₂)	5	~	321	-	-	323	-	-	-	-	-	-	-	-	-	325
Magnesium chromites		I] !						•							
MgO-Cr ₂ O ₃	4 -11	-	-	-	-	-	1055	1057	-	-	1059	-	-	-	-	~
	4-11	-	-	-	-	-	1055	-	-	-	-	-	-	-	-	-
4 МgO-Ст ₂ О ₃	4-11	ŧ	-	-	j -	-	1055	-	-	-	1050	-	-	-	-	
Magnesium chromite spinal	*-II	-]	-	-	-	-] -	, -	Ī	1059	-	-		-	-
Magnesium ferrites	ا!						1079	1091		_	1983				_	
MgO-Fe ₂ O ₂	B 3	1		_			1013	1031		1	1053		_	_		
MgO-2 FeO		-		-	-	353	-	-	1]	355	-		_	-	357
Magnesium fluoride (MgF ₂) Magnesium fluoride coating on quartz	5 6-II		361	-		- -	-	-		-	-	-	-	- 1425	1427	-
Magnesium germanide (Mg ₂ Ge) .	. I	}	309	_	-	_	31)	-	-	-	_	_	-	_	_	_
	5	467	-	-	_	_	_	-	<u> </u>	-	_	_	-	_	_	-
					-											

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Material Name	Volume	Density	Melting Point	Reat of Fusion	Heat of Vaporization	Heut of Sabilmation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Therinal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Magnesium-lead intermetallics (Mg ₂ Po)	6- <u>i</u>	-	-	-	-	-	650	-	-	- (-	-	-	-	-
Eagnesium lead silicate glass .	4-II	-	- 1	-	-	-	1771	-		-	-	-	-	-	-	-
Magnesium molybdate (MgG-MoO ₂)	4-11	-	-	-	-	-	-	1117	-	-	-	-	-	-	-	-
Magnesium niobates																
MgO-Nb ₂ O ₃	4-11	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
2 MgO - Nb ₂ O ₂	4-II	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
3 MgO · Nb ₂ O ₃	4-11	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
4 MgO - Nb ₂ O ₃	4-11	-	-	-	-	-	-	-	-	-	1125	-	-	-	-	-
Magnesium nüride (Mg ₂ N ₂)	5	-	- 1	-	- [-	-	533	-	-	-	-	-	-	-	-
Magnesium oxides			!													
Magnesium oxide (MgO)	\$- <u>;</u>	245	245	-	- 1	-	250	252	254	257	259	263	255-	269	-	271
м-500	4-1	-	-	-	-	-	-	-	-	-	259	-	267	-	-	-
PC-235	4-1	-	-	-	-	-	-	-	-	257	-	-	-	-	-	- 1
SR-2s03	4-1	-	-	-	-	-	-	-	-	257	-	-	-	-	-	- [
Magnesium oxide + Aluminum oxide	4-]	-	~	-	٠-	-	-	-	-	723	-	-	-	-	-	-
Magnesium exide + Aluminum oxide + Beryllium oxide.	4-1	-	-	-	-	-	-	-	-	-	725	-	-	-	-	-
Nagnesium oxide + Alamin.en oxide + Iron(ic) oxide + + Silicon (di-)oxide + Cascium oxide	4-1	-	-	-	-	-	-	-	727	-	-	-	-	-	-	-
Magnesium oxide + Beryllium oxide	4- <u>I</u>	-	-	-	-	-		-	729	-	731.	-	-	-	-	-
Magnesium oxide + Calcium	4- <u>1</u>	-	-	-	-	-	-	-	-	733	735	-	-	-	-	-
Magnesium oxide + Calcium oxide + Iron(ic) oxide	4- <u>1</u>	-	-	-	-	-	-	-	-	73"	-	-	-	-	-	-
Nignesium oxide + Chromum (sesqui-)oxide + Aluminum oxide + Iron(ic) oxide + + Silicon (di-)oxide Nignesium oxide + Chromium	4-1	-	-	-	-	-	-	-	739	-	-	-	-	-	-	-
(sesqui-)oxide + Iron(ic) oxide + Ahminum oxide + - Silicon (di-)oxide + + Iron(ous) oxide	4-1	-	-	-	-	-	-	-	741	-	-	-	-	-	-	-
Magnesium oxide - Iron(ie) oxide - Calcium exide	4-1	-	-	-	-	-	-	-	743	-	-	-	-	-	-	-
Magnesium oude + Magnes.cum Shuminate	4-11	-	-	-	-	-	-	-	1536	-	-	-	-	_	-	_
Megnesium oxide + Magnesium silicate	4-11	-	-	-	-	-	-	-	1535	_	-	-	-	-	-	-
Magnesium oxide + Nickel (mon-joxide	4-1	-	-	-	-	-	745	-	747	-	-	-	-	-	-	-
Magnessum oxide - Silicon (di-)oxide	4-1	-	-	-	-	-	-	-	749	-	751	-	-	-	-	-

Material Name	Volume	Denesy	Melting Post.	Hent of Funton	lient of Vaporization	Hoat of Sublimation	Electrical Resistivity	Spootfic Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectince	Thermal Transmittance	Vajor Pressure
Magnesium oxide + Tale	4-II	-	-	-	-	-	-	-	1533	-	-	-	-	-	-	-
Magnesium oxide + Tin(ic) oxide	4-1	-	_	-	-	-	-	-	753	-	-	_	-	-	-	-
Magnesium oxide + Titanium (di-)oxide	4-1	-	_	-	-	-	-	_	_	-	755	_	-	_	-	_
Magnesiem oxide + Tungsten cermet	6-1]	-		_		_	_	_		_	765					-
Magnesium oxide + Uranium (di-)oxide	4-1	-	-	_	-	_	-	_	757	_	.03	_	_	_		-
Magnesium oxide + Yttrium oxide	4-1	_		-	-	_	_	-			759	-			-	-
Magnesium o.cide + Zinc oxide .	4-1	-	-	-	-	-	-	-	761	-	-	-	-	-	-	-
Magnesium silicates																
MgO-SiO ₂	4-11	1235	ì∷≲S	-	-	-	1257	1289	1293	-	1295	-	-	-	-	- i
2 MgO-SiO ₂	4-11	-	-	-	-	-	-	1259	1291	-	1295	-	-	-	-	-
3 MgO - 4 SiO ₂ - H ₂ O	4-II	-	-	-	-	-	-	1259	-	-	-	-	-	-	-	-
Magnesium (ortho-)silicate + + Zinc (ortho-)silicate	4-II	-	-	-	-	-	-	-	-	-	1571	-	-	~	-	-
Magnesiam ailicides (Mg ₂ Si)	6-፤	- :	419	-	-	-	421	-	-	-	-	-	-	-	-	-
Magnesium silicide stannide (Mg ₂ Si _X Sn _{2-X})	6-1	-	-	-	-	-	537	-	539	-	-	-	-	-	-	-
Magnesium stannate (MgO · SoO ₂)	4-II	- ,	-	-	-	-	-	-	1361	-	-	-	-	-	-	-
Magnesium stannide (Mg/Sn)	6-1	533	533	-	-	i - i	535	-	-	-	-	-	-	-	-	-
Magnesium tatanates	1							1								
MgO-TiO₂	4-E	-	-	-	-	-	1439	1441	-	-	1443	-	-	-	-	-
Mg0-2 TiO ₂	4-II	-	-	-	-	-	1439	1441	-	-	1443	-	-	-	-	-
MgO-5 TiO ₂	÷-3	-	-	-	-	- 1	-	-	-	i - I	1443	-	-	-	-	-
2 MgO TiO ₂	4-D	-	- 1	-	-	- 1	1439	1441	-	-	1463	-	-	-	-	-
2 MgO 3 TtO ₂	4-D	i -	-	-	-	-	-	-	-	-	1445	-	-	-	-	-
Magnesium illanate procelain	5	1003	-	-	-	-	i -	-	1017	-	-	-	-	-	-	-
Magnesium tangriate (MgO-WO ₃)	4-11	-	-	-	-	-	-	1478	-	-	-	-	-	-	-	-
Wagnesium tungsten lead oxide (2 P50-MgO-WO ₃)	÷-11	-	-	-	-	- 1	-	-	-	-	بكدة	-	-	-	-	-
Magnesium vanadates	l				1]		1								
MgO-V ₂ O ₂	4-11	1	-	-	-	-	-	1452	-	- 1	-	-	-	-	-	-
2 MgO · V ₂ O ₅	4-11	1	-	-	-	-	-	1492	-	j -	-	-	-	-	-	-
Magnesium uranate (MgO-UO ₃).	4-21	-	1452	-	-	-		-	-	-	-	-	-	-	-	-
Magnesium zircocate (NgO-ZrO ₂)	4-13	1	-	-	-] -	-	ļ -	-	-	1512	-	-	-	-	-
Magnetic	4-3	1	J	-	-	-	-	2220	-	-	-		-	-	-	-
Manganese (Mn)	i :	642	542	i -	-	642	644	646	-	-	648	-	-	PSV	-	652 2
Manganese, electrolytic	1	-	-	-	-	-	-	646	-	-	645	-	-	-	-	-
Vsaganese + Aluminum	2-1	:	-	-	-	-	-	265	-	-	-		ļ -	-	-	-
Manganese + Copper	2-3	-	-	-	-	-	271	273	-	-	275- 271	-	-	•	-	-
		<u> </u>		<u> </u>	<u> </u>				<u> </u>							

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STORES CONTRACTOR STORES OF STANDERS OF STANDERS OF STANDERS OF STANDERS OF STANDERS OF STANDERS OF STANDERS OF STANDERS OF STANDERS OF STANDERS

Material Name	Volume	Density	Melting Point	lteat of Fusion	licat of Vaporszation	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Lineur Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Nanganese + Copper + ΣX_i	2- <u>11</u>	-	-	-	-	-	-	-	-	-	1053- 1059	-	-	-	-	-
Manganese + Nickel	2-1	-	-	-	-	-	279	-	-	-	251	-	-	-	-	-
Manganese + Nickel + ΣX_i	2-II	-	-	-	-	-	-	-	-	-	1091-	-		-	-	-
Manganese + Titacium	2-1	253. 519	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese alloys (special designations)																
A-47	2-1	-]	-	-	-	-	-	265	-	-	-	-		-	-	-
A-45	2-1	-	-	-	-	-	-	265	-	-	-	-	-	-	-	-
A-49	2-1	-	-	-	- 1	-	-	265	-	-	-	-	-	-	-	-
A-49.5	2-1	-	- 1	-	-	-	-	265	-	-	-	-	-	-	-	-
A-50	2-I		- 1	-	-	-	-	265	-	-	-	-	-	-	-	-
A-51	2-1	-	- 1	-	- 1	•	-	368	-	-	-	-	-		-	-
A-52	2-1	-	-	-	-	-	-	265	-	-	-	-	-	-	-	-
A-53	2-1	-	-	-	-	-	-	265	-	-	-	-	-	-	_	-
A-54	2-1	-	-	-	-	-	-	263	-	-	-	-	-	-	-	-
A-55	2-I 2-I	-	-	-	-	-	-	265 265	-	-	-	-	-	-	-	-
A-57	2-1	-	-	-	-	-	-	265	_		-	-	-	-	-	-
A-55	2-1		-	-		_	-	265	_		-		_		_	_
A-59	2-1	_	-	_		_	-	255	_	_	_	-		_		
1	2-1			_	_	_	_	265	i		_	-		_	_	_
Manyanese aluminate (AnG-Al ₂ O ₂)	4-2	-	-	-	-	-	-	-	-	-	1019	-	-	-	-	-
Nançanese alaminum carbide (Ma _p AiC)	s	-	-	_	-	-	_	73		! -	_	-	-	-	-	-
Marganese antimonide (Marth) .	6-1	-	-	-	-	-	69	-	-	-	-	-	-	-	-	-
Mangacese arsenide (Ma ₇ As)	6-1	-	94	-	-	-	-		-	-	-	-	-	-	-	-
Marganese arrecide telluride (MnTe _{1-X} As _X)	6-I	-	-	-	-	-	609	-	602	-	-	-	-	-	-	-
Manganese carbide (Mn ₂ C)	5	ត	67	-	-	-	-	ေ	-	-	•	-	-	-	-	71
Manganese chromate (Mr.)-Cr ₂ O ₂)	4-IJ	-	-	-	-	-	-	-	-	-	1061	-	-	-	-	-
Макраске ferrite (МаО-Fe ₂ O ₃).			-	-	-	-	-	-	-	i -	-	-	-		-	-
Manganese nickel	2-17	-	-	-	-	-	-	-	-	-	1273	-	- :	-	-	-
Manganese nitride (Ma ₂ N)	5	-	621	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese oxides						1		1	į	Ì						
i e	4-3	-	-	-	-	-	-	273	-	-	251	-	-	-	-	-
MaO ₂	4-1	-	-	-	-	-	-	275	-	-	281	-	-	-	-	- 1
Na ₂ O ₃	4-i	-	-	-	-	-	-	277	-	-	-	-	-	-	-	
NagO ₄	4-3	-	-	•	-	-	-	-	279	•	-	i -	-	-	-	- 1
Manganese (sesqui-)oxide + + Magnesium oxide	4-1	-	-	-	-	-	-	-	753	-	-	-	-	-	-	-

THE RESIDENCE OF THE PROPERTY

Asterial Name	Volume	Denaity	lotting Point	Heat of Pusion	Heat of Vaporization	lleat of Sublimation	filoetrical Rosistivity	Specific Heat	Thermal Conductivity	Thermal faffasivity	Thermal Linear Expansion	Thermal Absorptunes	Thormal Enittance	Therinal Reflectines	Thermal Trunamiliance	Vajkir Pressure
Manganese-palindium inter- metallics (MaPd)	6-1 >	-	694	=	=>	= &	22	×.	40	÷ 8	÷≃	÷<	- 22	+=	-1 -1	>
Mangasese phosphides	"		674			-	-	_	-	-	-	-	-	-	-	-
MaP	5	635	635	_	_	_	539	_		_	-	_	_	_	_	_
Na-P	5	-	635	_	_	_	-	_	_	_	_	-	_		_	_
Ma _s P	5	-	635	-		-	-	-	-	-	_	_	_	_	_	-
Ma ₃ P ₂	5	- 1	633	-	-	-	_	-	-	_	-	-	- 1	-	-	_
• •	6-1	-	_	-	-	-	_	341	-	-	-	-	-	-	_	-
Manganese silicate (MnO · SiO ₂) .		-	-	-	-	-	-	1312	-	-	1314	-	-	_	-	-
Manganese silicides	-															
Masia s.e.s	ŝ-ï	-	-	-	-	-	-	427	-	_	_	_	-	_	_	-
Mesi	6-1	-	423	-	-	-	425	427	_	_	431	_	-	_		_
iemSi ₂	5-1	-	-	_	-	_	425	427	429	-	-	-	-		-	-
Yaşsı	6-1	-	423	-	-	-	-	-	-	-	-	-	-	-	-	-
Negs,	5-2	-	423	-	-	-	-	- 1	-	-	-	-	-	-	-	-
Manganese telluride (MnTe)	5-1	-	-	-	-	-	-	595	- 1	-	-	-	_	-	-	-
Manganese zinc carbide (MagZnC)	5	-	-	-	-	-	-	75	-	-	-	-	-	-	-	-
Manganin	2-11	-	-	-	-	-	973	-	-	-	-	-	-	-	-	-
Maries 20	6-2	-	-	-	-	-	-	-	-	-	1945	-	-	-	-	-
Mariex 50	6-11	-	-	-	-	-	-	-	-	-	1045	-	-	-	- 1	
Managed	4-1	-	-	-	-	-	-	234	-	-	-	-	-	-	-	-
Matte silver	:	-	-	-	-	-	-	-	-	-	-	219	-	j -	-	-
Melamine formulóstyde	6-11	-	1014	-	-	-	-	-	- 1	-	-	-	-	-	-	-
Melanine formaldehyde, reinforced	6-11	-	-	-	-	-	-	-	-	-	i101	-	-	-	-	-
Melamine formaldehyde, alyka cellulose filled	6-17	-	-	-	-	-	-	-	~	-	1015	-	-	-	-	-
Melamine formaldehyde, mmeral filled	6-II	-	-	-	-	-	1916	-	-	-	-	-	-	-	-	-
Melanine-formaldehyde resia, reinforced	s-11	-	-	-	-	-	-	-	-	1125	-	-	-	-	-	-
Helmae 592	6-II	-	-	-	-	-	1915	-	-	-	-	-	-	-	-	-
Melrate 1077	S-11	-	-	-	-	-	-	-	-	-	1915	-	-	-	-	-
M=imac 1079	6-II	-	-	-	-	-	-	-	-	-	1015	-	-	-	-	-
	6-11	-	-	-	-	-	-	-	-	-	1015	-	-	-	-	-
	4-0	-	-	-	-	-	-	1239	-	-	-	-	-	-	-	~
Mercune sekunde (ligSe)	l i	-	-	-	-	-	-	343	-	-	-	-	-	-	-	-
Metal cermets	ē-D	i	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6-□	-	-	-	-	-	-	-	-	-	-	1369	!!	-	-	-
	6-E	-	-	-	-	-	-	-	-	-	-	1325	.6:	-	-	-
i :	6-II	-	-	-	-	-	-	-	-	-	-	1407		-	-	-
Metco XP-1119	6-II	-	-	-	-	-	-	-	-	-	-	1421	1423	-	-	-

Material Nime	Volume	thenesty	Molting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resiminity	Epecific Heat	Thermal Conductivity	Thermal (Mifuelvity	Theymal Linear Expansion	Thermal	The ring	Thermal Reflectings	Thermal Transmittance	Vapor Pressus
Nica Nica	5	953	-	-	-	-	945- 957	-	9:9- 361	-	350- 2501	-	-	-	-	-
Biotze	3	-	-	-	-	-	-	-	-	-	557	-	-	-	-	-
Cericie	3	-	-	-	-	-	-	-	-	-	553	-	-	-	-	-
Glass Sonded	5	-	-	-	-	-	557	-	-	-	-	-	-	-	-	-
lli⊈e	5	-	-	-	-	-	-	-	-	-	550	-	-	-	-	-
iron	5	-	-	-	-	-	-	-	-	-	557:	-	-	-	-	-
Magnesiam	5	-	-	-	-	-	-	-	-	-	555	-	-	-	-	-
Masconize	5	-	-	-	-	-	345	-	-	-	1661	-	-	-	-	-
Phlogophite	5	-	-	-	-	-	-	-	-	-	595	-		-	-	-
Ripidolze	5	-	-	-	-	-	-	-	-		3 55	-	-	-	-	-
್ರೀಪ ರೀಚಂ	5	-	-	-	-	-	953	-	351	-	-	-	-	-	-	-
Symbetic, barium	5	-	-	-	-	-	3 5€	-	-	- ;	-	-	-	-	-	-
Zism waldite	5	-	-	-	-	-	-	-	-	-	595	-	-	-	-	-
Micre-Quartz type II	6-P	-	-	-	- 1	-	-	1215	-	-	-	-	-	-	-	-
MIL-C-7350 type I and II	6-II	-	-	-	-	-	-	-	-	كتنة	-	-	-	- 1	-	-
Mil-4. ¥21 type I	ê-11	-	-	-	-	-	-	-	-	1275	-	-	-	-	-	-
MIL-C-5957	€-11	-	-	-	-	-	i -	954	956	-	5 56	-	-	-	-	-
Mineral aluminum allocates	+-11	-	-	-	-	-	1137	-	-	-	-	-	-	-	-	-
೫೦-9-ಕೆ ವಾಸ್ತಿಕಿಕೆದಾದ್ದಾ	1	-	-	-	-	-	-	655	-	-	-	-	-	-	-	-
Mohibienite	5	£30	≥ ∞0	-	-	-	-	-	-	-	-	-	-	632	-	-
Nohideam (Ne)	1	654	554	-	-	654	CS6	ಮಕ	669	663	Œ	ब्धः	985 675	677	-	677
Modybelenam conted with boron .	5- Ⅱ	-	-	-	-	-	-	- 1	-	-	-	-	12%	-	-	-
Mohidenin costed with carbon.	6-II	-	-	-	-	-	-	-	-	-	-	2233	1256	-	-	-
Kolybdenica conted with silicide	6- 13	-	-	-	-	-	-	-	-	-	-	-	3467 3469	1471	-	-
Mohidosen costed with tilanism (di-) onde met alanism	6-13	-	-	-	. i	_	-	-	-	-	-	-	1356	-	-	-
Melybdenum exiting on iron	6-11	_	-	-	-	-	-	-	-	-	-	1389	1311	_	-	- !
Molybeleman + DX;	2-2	1103	-	_	-	-	-	-	-	-	-	-	-	-	-	- 1
Molybidenum - Iron	2-1	245	-	-	-	-	-	257	230	-	-	_	-	-	-	- 1
Mahadama + Nakel + EK;		1190	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Noisteinum - Nichtum - Di			-	-	-	-	-	-	-	-	-	-	-	-	-	
Molybdenem - Schoon	2-1	-	-	-		-	-	-	-	-	-	-	22:1	-	-	-
Kohbómun - Türmun	2-3	-	-	-	-	-	2503	23/5	297	290	301	-	28G-	3309	-	-
Molyhdemum - Tilanium - EX, .	2-D	1763	-	-	-	-	-	1105	-	-	1277	-	-	-	-	- i
Holybornum - Tungsten	2-3	-	-	-	-	-	-	311	313	315	317	-	215	-	-	-
Nohtšenan alanindes																
Modi	6-3	-	9	-		-	-	-	-	-	11	-	-	-	-	- 4
360£3 ₂	i-i	- 1	-	-	-	-	-	-	-	-	11	-	-	-	-	- [
MojAl	6-1	-	3	-		-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	LXuefty	Melting Pol:1	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffueivity	Thermal Linear Expansion	Thermal Absorptance	Thorinal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Molybdenum beryllides																
MoBe₂	6-1	-	102	-	-	-	-	- 1		-	-	-	-	-	-	-
MoBe _{ff}	6-1	102	-	-	-	-	-	104	106	-	-	-	- 1	-	-	-
Molybdenum borides		l														
MoB	6-1	-	186	-	-	-	-	188	-	-	-	-	- 1	-	-	192
МоВ₂	6-1	-	186	136	-	-	-	188	-	-	19ü	-	~	-	-	-
Мо₂В	6-1	-	186	-	-	-	-	188	-	-	-	_	-	-	-	192
Mo ₂ 8 ₈	6-I	-	186	-	-	-	-	-	-	-	-	-	-	-	-	-
Mo ₃ B ₂	6-I	- ļ	186	-	-	-	-	-	-	-	-	-	-	-	-	-
	6- <u>I</u>	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
'Di-) molybdenum boride + + (Penta-) niobium (tri-) - silicide	ŏ-I	_	724		_	-	_	_	_	_	-	-	-	_	_	_
(Di-) molybdenum boride + + Tantalum (di-) silicide	6-J	_	724	-	-	-	-	-	-	-	-	-	-	-	-	_
(Di-) molybdenum boride + + (Penta-) tantalum (tri-) - silicide	6-I	-	724	-	-	-	-	-	-	-	_	-	-	-	-	-
Molybdenum carbides		- 1							l							l
MoC	5	-	-	-	-	-	-	-	-	-	87	-	-	-	-	-
Mo₂C	5	77	77	-	-	-	79	81	83	-	85	~	89	-	-	-
Molybdenum chromium silicides															ĺ	l
(Mo, Cr, Si)	6-1	523	÷	-	-	-	-	-	-	-	-	-	-	-	-	-
(Mo,Cr)Si ₂	6-I	523	-	-	-	-	-	-	-	-	-	i -	-	-	-	-
Molybdenum germanide	6-I	_	313	~	_	_ '		_		i		_			_	315
(320)	5	_	621	_	_	_	-	-	-	-	-	-	-	-		
Molybdenum oxides	ľ	-	022	_	_	-	-	-	-	-	-	1	-	-	-	-
•	4-1				_		_	285		_	۱.	_	<u> </u>			
MoO ₂	4-1	283	283	283	_	-	_	287	-	_	-	-	l	289]	291
MoO ₃	5	635	635	200	_	-	639]			_		_
Molybdenum phosphide (MoP) Molybdenum selenides (MoSc ₂) .	6-1	-	-	-	_	-	367	! -	- 569] _	1] _] _]]	1
Molybdenum silicides	"	-		_	-	-	30.		***] -	-]	-	1	l -	-
MoSi ₂	6-1	433	433	-	-	-	435	437	439	-	441	-	445- 447	449	-	-
Mo _s Si	6-1	_	-	-	-	-	ļ _	_	_	-	443	-	-	۱.	-	451
Mo ₂ Si ₂	6-1	433	433	_	_	-	_	-	_	_	443	! -	-	-	_	-
Molybdenum (di-)silicide + + Calcium aluminate	5	-	-	_	_	-	-	-	 	_	904	-	_	-	_	-
Molybdenum (di-)silicide + + Chromium (sesqui-)oxide	s	-	-	-	-	-	-	-	-	-	-	-	906	-	-	-
Molybdenum (di-)silicide + + Chromium (di-)silicide	6-1	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molyi-denum (dı-) silicide +			l	l	l	1	İ	1	l	1	1	l	1	1	l	

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporiration	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Lineer Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Molybdenum (di-)silicide + + Molybdenum (tri-)oxide	5	-	-	-	-	•	-	-	-	-	-		908- 910	912	-	-
Molybdenum (di-)silicide + + Molybdenum (tri-)oxide + + Silicon (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	914- 916	918	-	-
Molybdenum (di-)silicide + + Silicon (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	920- 922	924	-	-
Molybdenum (di-)silicide + + Zirconjum (di-)boride	6-1	-	689, 724	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum-silicon-titacium cermet	6-П	930	_	-	_	_		_	_		_	_	_	_		_
Molyhdenum sulfide (MoS ₂)	5	690	690	-				_			_	_	_	692		
Molybdenum tellurides (MoTe ₂).	1 1	-	-	_	_	_	638	_	640	_	_	_	_	_	_	_
Molybdenum-titanium alloys	6-31	-	-	-	-	-	-	-	-	-	-	-	1505- 1509	-	-	-
Molybdenum-titanium alloy coated with Durak-MG	6-II	-	-	-	-	-	-	-	-	 -	-	-	1561- 1503	-	-	-
Molybdenum-zirconium inter- metallics (Mo ₂ Zr)	6- <u>1</u>	-	684	-	_	_	-	-	-	_	-	-	-	-	-	÷
Monel	2-1	-	-	-	-	-	-	-	-	-	343	-	-	-	-	-
• • • • •	2-11	-	-	-	-	-	-	1239	1241	-	124° 1251	-	1253	-	-	-
Monel 400	2-11	-	-	-	-	-	-	1239	1241	-	1247-	•	1253	-	-	- :
Monel 401	2-11	-	-	-	} -	-	-	-	-	-	988	-	-	-	-	-
Monel 403	2-11	-	-	-	-	-	ļ -	-	-	-	1249	-	-	-	-	-
Monel 404	2-11	_	-	- _	_	-	_	-	-	1	1245] -		-	-	-
Monel 501	2-11	_		_	-	"	-		1241	[143	-	-	-	-	
Monel, H-	2-II 2-II	1237	_	-	1 -		-	1239	1241	1243	1245	l -	1		_	1
Monel, K	2-11	1237		<u> </u>	-	-	<u> </u>	1239	1241	1243	1245	_	-		; -	_
Monel K-500	2-11] -	_	-	-	-	-	-	-		-	-	1255	_	_	-
Monel, KR-	2-E	-	-	-	-	-	-	-	-	_	1245	_	i -	_	_	-
Monel, R	I	-	_ '	-	_	-	-	-	1241	-	1247	1	-	-	-	-
Monel, R-405	I	-	_	_	_	-	-	_	1241	I	1247	!	-	-	-	-
Monel, S-	1	-	-	-	_	-	l -	İ -	1241	1	-	-	-	-	l _	-
Monel, Si-	i	-	-	-	-	-	-	-	1241	-	-	-	-	-	 -	۱ -
Moplen	1	1076	1076	-	-	-	-	1078	1080	-	1088	-	-	-	-	 -
Mullite	1	1	-	-	-	-	-	1189	1191	1193	1197	-	1201	-	1203	-
Mullite MV-20	1	1	-	-	-	-	-	-	-	1193	-	-	1201	-	-	-
Mallite MV-30	4-1	-	-	-	-	-	-	-	-		617	-	-	-	-	-
						<u> </u>						<u> </u>	<u> </u>	<u> </u>		

Material Name	Volume	Density	Molting Point	Heat of Fusion	Heat of Vaporization	Heat of Cubilmation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffunivity	Thormal Linear Expansion	Thormal Absorptance	Thermal Emittance	Thermal Reflectance	Thormal Transmittance	Vapor Pressure
Mulliké + Alumina	4-11	-	-	-	-	-	-	-	1562	-	-	-	-	-	-	-
Muscovite	4-0	-	-	-	-	-	-	1573	-	-	-	-	-	-	-	-
MX-4926 carbon-phenolic laminate	7 <u>1</u> -9	- 1	_	-	-	-	_	1134	-	-	_	_	-	_	-	_
Mylar costed with aluminum	6-II	-	-	-	-	_	-	-		-	-	-		1287	-	l* -
Mylar coated with copper	6-11	-	-	-	-	-	-	-	-	-	- 1	-	-	1301	_	i -
Mylar coated with gold	6-II	-	-	-	-	-	-	-	-	-	-	-	- 1	1307	-	i -
Mylar coated with silver	6-II	-	-	-	-	-	-	-	-	-	-	-	-	1323	-	-
N	Ì															
NBS coating A-418 on Incomel	6-11	-	-	-	-	-	-	-	-	-	~	-	1361- 1363	-	-	-
NBS coating A-418 on stainless steel	6-Ц	-	-	-	-	-	-	_	-	-	-	_	1365-	_	-	_
NRS coating N-143 on Incomel	6-11	_	_		_	-			_	_	_	_	1367 1353-	_		_
NBS coating N-143 on stainless	0-11												1355			
steel	6-II	-	-	-	-	-	-	-	-	-	-	-	1357- 1359	-	-	-
Neodymia	4-1	293	293	-	-	-	-	295	-	-	297	-	-	-	-	-
Neodymium (Nd)	1	681	681	681	681	683	684	686	-	-	788	-	-	-	-	690
Neodymium + Magnesium	2-1	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium + Magnesium + ΣX_1 .	2-11	1115	1115	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium aiszninide (NdAl)	6-1	43	-	-	-	-	-	-	-	-	-	-	j -	-	-	-
Neodymium-bismuth inter- metallics (NdBi)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium borides									l				1			
NdB ₄	6-1	236	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NdBg Neodymium-cadmium inter- metallics	6-I	296	296	-	-	-	300	-	-	-	-	-	-	-	-	-
NdCd	6-I	680	-	-	-	-	-	-	-	-	-	-	 -	-	-	i -
NdCd₂	6-I	690	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NdCd ₂	6-1	650	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NdCd _{ii}	6-1	690	-	-	- 1	-	-	-	i _	-	-	-	-	-	-	-
Neodymium carbides				1									İ			
NdC ₂	5	294	294	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd ₂ C ₃	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium chloride (NdCl ₂)	5	339	-	-	! -	-	-	-	-	-	-	-	-	-	-	-
Neodymium-cobalt intermetal- lics (NdCog)	6-I	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-copper intermetal- lics (NdCu ₄)	6-1	690	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-gallium intermetal- lics (NdGa ₂)	1-6	680	-	-	-	-	-	-	-	-	-	-	-	-] _	-

Material Name	Volume	Denetty	Molting Point	Heat of Fusion	lient of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Rent	Thermal Conductivity	Thermal Diffusivity	Thormal Linear E.pansios.	The avi	The mal Emittance	Thermal Kelbutance	Transmitance	Vapor Pressure
Neodymium germanides (NdGe ₂).	6-1	323 467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodynsium hydride (NdH ₂) Neodynsium-lead intermetallica (NdFb ₂)	5 6-1	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium-mercury intermetal- lies (Nelig)	1 - 1	689	_	_	-	-	-	-	_	-	_	_	-	_	_	_
Neodynaium-nickel intermetallics (NdNig)	6-I	680	-	_	-	-	-	-	-	-	-	-	-	_	-	_
Nextymium nitride (NeX)	5	621	-	-	-	-	-	-	-	-		-	-	-	-	-
Neodymium-osziam iztermetal- lics (NdOs ₂)	6-]	680	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neodymium oxides																
NdO	4-1	293	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd ₂ O ₃	4-1	293 635	293	_	_	-	-	295	-	-	297	-	-	-	-	-
Neodyntium phosphide (NdP) Neodyntium selenides	5	633	_	-	-	-	•	-	_	-	-	•	-	~	-	
Newty Hamin seasonnes NdSe	6-1	365	_	_	_	_	_	_	_	_	_	_	_	_	_	_
Nd ₂ Se ₂	6-1	365	-	_	-	-	-	-	_	-	-	-	-	-	-	_
Nd ₂ Se ₄	6-1	365	-	_	-	_	_	-	_	-	_	_	_	-	-	-
Neodymium silicide (NdSi ₂)	6-1	523	524	_	_	_	527	_	_	-	_	_	_	-	~	_
Neodymium-silver intermetallics (NdAg)	6-1	630	-	-	_	-	-	-	-		-	-	-	-	-	-
Neodymium sulfides					[-		
NdS	5	694	694	-	-	-	-	-	-	-	696	-	-	-	-	
NdS ₂	5	-	694	-	-	-	-	-	-	-	-	-	-	-	~	-
Wd₂S₂	5	694	694	-	-	-	-	-	-	-	696	-	-	-		-
Nd _i S ₄	5	694	694	-	-	-	-	-	-	-	-	-	-	-	-	-
Neoprene GN	6-11	-	-	~	-	-	-	-	ļ - ļ	1066	-	-	-	-	-	-
Neoprene W	6-Iì	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nepheline syenite	4-11	-	-	-	-	-	-	-	-	-	1320	-	-	-	-	-
Neptunium (Np)	1	692	692	-	-	-	-	-	-	-	-	-	-	-	-	-
Neptunium + Calcium + ΣX_i	2-11	1111		-	-	-	-	1113	-	-	-	-	-	-	-	-
Neptunium + Uranium	4	321	321		-	-	-	-	-	-	-	-	-	-	-	ļ. -
Neptunium bromide (NpBr ₂)	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	~
Neptunium chlorides		339	_	_	_	l _	_	_ :		_		_ '	_ '			
NpCl _g NpCl _k	1_	339] _		1		_	-			[֓֞֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	1]
NpCl ₄	1 :	-	_	_	-	-		25.9] _]	_	_ :		۱ <u> </u>	_	
Nichrome	2-3	_	_	-	-	_	-	-	-	-	_	- -	331	_	_	-
Nickel (Ni)	1	694	C94	-	-	-	696	696	700	702	704	1	708- 714	i	•	720
Nickel, carbonyl	1	-	694	-	-	-	-	-	-	-	-	-	-	۱ -	-	
Nichel, electrolytic	2	634	694	-	-	-	-	6\$3	-	-	704	-	-	?15	-	-

Mats-iu! Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublination	Electrical Resistivity	Sperific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emiliance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Nickel coated with uluminate phosphate																十一
Medial & Sw	6-II 2-II	1307	-	-	-	-	-	-] -	-	-	-	1420	-	-	-
Mickel + Aleminum	<u> </u>	130,	[-	1309	1311	1313	1315	-	-	-	-	-	-
$Xickel + Alaminum + \Sigma X_i$	3.4	_	_	-			325	-	j -	-	-	-	-	-	-	-
Rickel + Chromium	2-1	_	-	_	i		327	329]	_	1117	-	-	-	-	-
Nickel + Chromium + \sum_{i}	2- <u>I</u> I	1119	1113	-	-	-	1124	1126-	1134	1145-	1152-	-	331- 333 1172-		- -	-
Nickel + Cobelt	2-1	335		_	ا .	-	_ :	1132	11-i5 337	1150	1170		1201	1215		i
	2-II	1219	1227	-	-	_	1221	_ :	1273	_	- 1225-	-	- 1229-	_	-	-
Water Comme											1227	-	12231	l -	-	-
Nickel + Copper + DX	2- <u>I</u>	-	-	-	-	-	339	341	-	-	343	-	-	-	-	-
	2-II 2-I	1237	-	-	-	-	-	1239	1241	1243	1245- 1251	-	1253- 1255	-	-	-
	:-II	1257	_		-	-	345	347 1259	345 1261	-	1263-	-	-	- :	-	-
									1201	-	1267	-	1269	-	-	-
	2-1	-	-	-	-	-	351	-	353	-	555	-	-	-	-	-
i ' ' i	2-11	-	-	-	-	-	-	1271	-	-	1273	-	-	-	-	-
Michel + Molyndenum + ZXi	Z-2	1277	1275	-	-	-	-	1279	1281	-	1283 1287	1285	1291- 1295	1297	-	-
	2- <u>1</u>	-	-	-	-	-	357		_	- i	-	_	-	_	_	
	2-II	-	- j	-	- ,	-	-	-	-	-	1299	-	_	-	-	_
	2-1	-	-	- }	- 1	-	359	- !	-	-	-	.	-	-	-	-
	2-11	- !	- [-	-		-	-	-	-	1391	-	-	-	-	-
l	2-II	-	-	-	-	- j	-	-	- [-	1303	-	-	-	-	-
	2-11 2-1 ;		_	-	-	- (-	-	-	-	1305	-	-	-	-	-
	2-11	1307	_	-		- 1	-	-	-	-	355	-	-	-	-	-
	2-E	-	_	_ !	_		_	-		-	1227	-	-	-	-	-
	2-1	-	-	- !	-	_	_	_			355	-		-	-	-
Nicibel 270	. !	-	-	-	-	- [-	-	-	_	704	- I		_		
	1	-	- [-	-	-	- 1	-	700	-	-	-	_	_ [_
(also)		-	-	-	-	-	-	-	-	-	355	-	_ !	-	-	_
(zlso)	,	1307	-	-	- [- 1	- [-	1313	-	-	-	-	-	-	-
Nickel, admiralty		-	-	-	- }	-	-	-	-	-	968	-	-	-	-	-
Nickel D		-	-	- [-	-	- !	-	-	-	355	- [- [-	-	-
(also) Nickel, grade A		-	-	-	-	-	-	- 1	1313	-	-	·]	-	-	- [-
Nickel, grade A		694				-	-	-	700	-	704	706	710- 712	715	-	-
(also)		-	-!	_	_	_		_	353 1223	-	1263,	-	-	-	-	-
	- 1	1			1	-	_ [-		- 1	1301	-	-	-	- i	-
Nickel L	•	-	-	-	-	-	-	-	700	-	-	-	-	-	-	-
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Material Name	Volume	Dynasty	Molting Point	fight of Funion	livat of	Vaporization lest of	Sublimation	Electrical Hosfativity	Specific Heat	Thermal	Conductivity	Diffuelylty	Thormal Linear Expansion	Thormal Absorptance	Thermal Emittance	Thermal Reflectance	Thormal Transmittance	Vallor Breesure
Nickel alloys (special designations)	-			†	+		*		35	F	5 5	A	- 4	\$5	ĘĒ	M.T	44	\$
60 - 35 Cr (ASTM 583-46)	2-1	1257	_	1	l	-					1			1				
60 Ni - 20 Cr	. 2-1		-]	! -			- 1	1259		-	·	- i	- 1	-	-	-	۱ -
90 Ni - 16 Cr	2-1	ıl -	_	1 -	-		-		1130	214	٠	.	-	-	-	-	-	-
AISI alloy (see AISI design: tions)	·-							_	1126	-	-	Ì	-	-	-	-	-	-
Aiumel	. 2-3		_	i	1	i	!	. !		j	1	- [j		Į	l		
Astroloy	1 -	1		-	1 -	-		-	1271	-	-		- i	-	-	- Ì	_	_
Brazing alloys GE-62	. 2-11	Ί.			j -	-		-	-	-	-	.	- 1	- 1	1225	1231	_	_
Brazing corspound GEH 62-		۱ -	_	-		-		- [-	-	-	11	5 5	-	-	-	_	_
Chrossel-P	. 2-1	-	_	_		-		- 1	1130	-	-	-	-	-	-	- 1	-	_
Contracid	. 2-11	- 1	_	_			i	-	329	-	-	-	-	-	-	-	-	_
D-979	. 2-II	-	-	_	۱.			- !	-	1261	-	-	٠	-	-	-	-	-
Duranickel 301	. 2-11	-	_	_	_				-	1261	-	-	- 1	-	-	-	-	-
DVL32	. 2-II	1219	-	_	l -	_			- j	-	i -	ш	1	-	-	-	-	-
DVL 321a	. ''-II	1219	- 1	-	_	۱.			-	-	-	122	`	-	-	-	-	-
DVL 3211	. 2-11	1219	-	_	_	_	İ.		_ i	-	j -	122	Ţ	-	-	-	-	-
IWL 325a	. 2-II	1219	-	_	_	_	Ι.	1	_	-	-	122	·	- [-	-	- 1	-
EI-435	- 2-II	- [-	-	-	-	١.	ı	. !	-		122	5 •	- [-	-	- [-
E1-437	. 2-1	-	-	-	-	-	١.	1	[1144 1140	1150	-	1.	-	-	-	-	-
EI-607	. 2-II	-	-		-	_	۱.	- 1		1145			1	- 1	·j	-	-	-
E1-617 GMR-235	· 2-II	-	-	- [-	-	۱ -	-	- ľ		-	115	1	1	-		-	-
Hacking alloy 667.	2-II	-	-	-	- 1	-	-	-	-	_	_	116	1		- 1	- 1	-	-
Haynes alloy so. R-41.	2-11	-	-	-	-	-] _	- [.	-	-	_	1273		- 1		- 1	-	-
Hayaes alloy 2	2-11	-	-	-	-	-	Í -	1.	- 1	-	-	1154	1	- 1		- 1	-	-
Hastelloys (see Hastelloy)	2-II	-	-	-	-	-	-		- 1	-	_	_		- 1	- 1	ł	-	-
HU		- 1		- 1	ı				- 1			_	-	"	""	• •	-	-]
AM.	2-11	-	- 1	-	-	-	-	.	-	- 1	_	1265		١.				
Internalloy	2-11	- i	-	-	-	-	-	-	-	-	-	1267	1_			- 1		- }
Illiana G	2-II 2-II	-	-	-	-	-	-	-	-	-	-	1156	1 -					-
Illiana R	2-11		-	-	-	-	-	-	- 11	136	-	_	-	Ì.				-
laco (see laco)		- !	-	-	-	-	-	-	· 2	7.28	-	-	ļ _	-	1.			
Lacoloys (see incoloy)		- 1						1		1	1		1	ļ	!	-		-
incomels (see Income!)						i		1			İ		1	1		1		- 1
DIOR-8	2-II	_	- İ	_ İ	_	ì		1	i	- 1	I				Ì	1	1	
-1500	2-11	-	_ .			- 1	-	-		191	-	1285	-	129	3 -	-	1.	.
1-1619	2-11	- .	_ .	_	-		-	-	- 1	36		1186	-	-	-	-		.]
1-252	2-11		. .	_		_	-		ŧ	34		1156	-	1 -	-	-	-	.
Cont's (see Monel)						-	-	1113	111	*	-	110¢	-	119	120	-	-	
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Material Xame	Volume	Denatty	Melting Point	Heat of Fusion	liest of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific itent	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Refluctance	Therma. Transmittance	Vapor Pressure
Hickel alloys (special designa- tions) (cost.)																
	2- <u>I</u> 2-I	-	-	-	-	-	-	-	-	-	1267	-	331	-	-	-
Ricarome V	2-E	_	-	-	-	-	-	1130	1144	_	_	_	-	_	_	_
Missoules (see Missoule)	-															
OKA 20048	2-A	-	-	-	-	-	-	1132	1136	3259	-	-	-	-	-	-
CKCh 21X78T	2-II	-	-	-	-	-	-	1122	-	1150	-	-	-	-	-	-
Permanichal 300	2-E	1257	-	-	-	-	-	- '	-	-	1303	-	-	-	-	-
	2-I	-	-	-	-	-	-	-	337	-	-	-	-	-	-	-
BCA-3897 Refractator 26	2-I 2-II	-	-	_	-	_	-	-	1223	-	- !	-	-	-	-	-
Rate 41	2-11	1122	-	-	-	-	-	1130	1134	-	1156	-	1154. 1159	1211	-	-
SM-300	2- <u>11</u>	-	-	-	-	-	- 1	-	-	-	1305	-	-	-	-	-
	2-E		! _	_	_	_	_	_	1136	_	_	_	_	_	_	_
Wespeliny	2-II	-	-	-	-	_	_	-	1125	1 -	1154	-	-	-	-	i -
Nichel aluminate (200-Al ₂ O ₂).	4-II	-	-	-	-	-	-	-	-	Ī -	1021	-	1923	-	-	-
Nichel alumicides							1	İ				İ				ļ
RIAI	6- <u>1</u>	-	-	-	-	-	-	-	-	-	13	-	15- 17	29	-	-
M _e ix	6-I	-	-	-	-	-	-	-	-	-	13	-	15- 17	19	-	-
Nickel aluminides coating on Incomel	6-B	-	-	-	-	-	-	-	-	-	-	-	1453- 1455	1457	-	-
Nicled aluminide + Aluminum oxide	5	-	-	-	-	-	-	-	-	-	-	-	546 546	845	-	-
Nickel aluminide + Nickel (mon-) oxide	5	-	-	-	-	-	-	-	-	-	-	-	850- 852	554	: - 	-
Nickel aluminide + Nickel (mon-) oxide + Aluminum oxide	5	-	-	-	-	-	-	-	-	-	-	-	856- 858	869	-	-
Nickel borides				 	i		Ì	1		1		}	1	}		
	6-1	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-
1	6-1	-	296	-	! -]	-	-	-	-	-	i -	-	-	j -	-	-
	6-1	-	296 294	_	1		l	-		-	-	-	-	-	-	-
Nickel car'dds (Ni ₂ C) Nickel chrome spinel costing on niobism-zirconium alloys	S		294	_	_	j -		_	_	_	_	_	1397		-	-
Nichel chromite costing on michian-zirconium alloy			-	~	_	-	-	-	-	-	_	-	1367	_	 -	_

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Material Name	Volume	Density	Melting Point	liest of Fusion	llent of Vaporízation	Heat of Bullmation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermul Linoar Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Nichel-chromium alloy conting on Incomel X	6-II	-	-	-	-	•		_	-	-	-	-	1333	1335	-	_
Nickel ferride (NigFe)	6-1	-	_ !	_	-	_	-	-	_	_	201	-	_	_	_	_
Nicke: ferrite (NiO-Fe ₁ O ₂)	4-11	-	- 1	_	-	-	1067	1939	- 1	-	1091	-	- 1	_	_	_
Nickel ferrite spinal	4-11	-	-	-	-	_	-	1989	-	-	-	-	-	-	_	-
Nickel-lead silicate glass	4-11	-	-	-	i -	-	17:3	-	-	-	-	-	-	-	-	-
Kichel-monganese intermetallics (Nights)	6-1	-	-	-	-	-	652	654	-	-	_	-	-	_	-	_
Nickei (mon-)oxide (NiO)	4-2	-	-	-	-	-	-	301	363	-	305	-	387- 389	371	-	-
Nickel (mon-) ocide + Magnesium oxide	4-1	-	-	-	-	-	-	-	765	-	-	-	-	-	-	_
Nickel (mon-) oxide + Nickel aluminide	5	-	-	-	-	-	-	-	-	-	-	-	777- 779	781	-	-
Nickel phosphides																l
Ni ₂ P	5	-	G5	-	-	-	-	-	-	-	-	-	-		-	-
Ni ₂ P	5	-	635	_	-	-	-	-	-	-	-	-	-	-	-	-
M ₂ P ₅	5	-	535	-	-	-	-	-	-	-	-	-	-	-	-	-
Nichel selmides	li															
NiSele-Le	6-I	345	-	-	-	-	-	347	- 1	-	-	-	-	- 1	-	-
Nickel suitcides																
nsi	6-1	-	453	-	-	-	-	-	-	-	-	-	-	-	-	-
NISi ₂	6-3	-	453	- 1	-	-	-	-	-	-	- !	-	-	-	-	-
N ₂ SI	6-3	-	453	-	-	-	-	-	-	-	455	-	-	-	-	-
Night	6-1	-	453	-	-	-	-	-	-	-	455	-	-	-	-	-
:455	6-1	-	453	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel-tanzalum intermetallics	i l	_														
(Nights)	6-1	-	654		-	-	-	-	-	-	-	-	-		-	-
NICSEL VELBRINGES	64	_		_	_	_	_	694	_	_						
	5-1	-] _		_				-	_	-	_	-	-	-
NGC	٠ ا	_]	-		-	[694		-	-	-	_	-		1
Nickel tRanste (NiO-TiO ₂)	1 1	_]			1452			_]	_				-
Nicel sinc ferrite (Ni_ZsO·Fo _i O)	li						19.00	1093	1095	-	_	-	•	-	-	•
Nichel-zirconism intermetallics	-		!													-
NiZr	6-1	-	684	_	_	i _	_	_		_		_	_	_ '	_	_
Ni ₂ Zr	6-1		654	-	-		_	_	_	_	_	_				_ ا
Ki ₄ Zr	C-I	-	G84	_	_	_		_		_		_			-	
Nimonic 75	2-0	-	-	-	_	-	_	-	1144	_	_	_	1182		_	_
Nimonic 80	2-11		-	-	_	-	_	-	1140	_	-	_	_		_	_
Nimonic 80/SGA	2-11	-	_	_	_	_	-	-	1140	_	-	_	_	۱.	_	-
Nimonic 30	2-11	-	-	-	i -	- '	-	-	1136	ا -	_	_	-	_	_	_
Ximonic 95	2-11	-	-	-	-	-	-	-	1136	-	-	-	-	-		-

References between the company of the contract

Material Name	Vetunse	Density	Mailing Poir	Heat of Purion	Heat of Vaporization	Heat of Bublination	Electrical Resimivity	Specifin Heat	Thermal Conductivity	Thermal IMMusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emistance	Thermal Malietance	Thermal Transmittance	Vapor Pressure
Nimenic 100	2- 2	1219	1217	į .	_	-	_	-	1223	-	1227	-		_	_	_
Minimic 106	2- <u>1</u> 1	-	-	-	-	-	i -	-	:223	-	-	-	-	-	-	-
Nichtum (16)	1	722	722	i -	-	-	724	736	728	730	732	-	734- 428	780	-	742
Mobium conted with abunishie .	6-22	-	-	-	-	-	-	-	-	-	-	-	1435-	1439	-	-
Nichiam coated with nichiam	6- 3	-											1437			
Mobium +ΣX,	2.3		-	-	-	_	-	- 1361	-	-	- 1	-	-	1450	-	-
Mehlum + irun + EX	2-11	_	_			_	-	1317	-	-	-	-	-	-	-	-
Nobium + Molybdonum + EX ₁ .	2-2	1319	_	_	_	_		1321	1323	1225	1327	-	-	-	-	-
Mobbum + Tantalum	2-1	-	361	_	-	_	363	-	365	_		-	_	_	-	_
Michigan + Tentahan + $\sum X_{j}$	2-E		-	-	-	-	-	1322	1331	1353	i335	-	_	_	-	-
Mohdum ÷ TRantum	2-1	-	-	-	-	-	367	_	-	-	-	-	-	-	-	_
Niehinn + Thuman + $\Sigma x_i \dots$	2-Ⅲ	1337	-	-	-	-	-	1339	1341	2343	1345	-	1317	-	-	-
Nothing + Tungston	2-1	-	-	-	-	-	-	-	-	-	-	-	369- 371	-	-	-
$Xiohium + Tunguten + \Sigma X_1 \dots$	2- E	-	-	-	-	-	-	1349	1351	1353	1365	-	-	-	-	-
Mohiam + Uzsadasa	2-1	-	-	-	-	-	-	-	373	-	375	-	-	-	-	-
McMum + Vene Hem	2-1	-	-	-	-	-	377	-	-	-	-	-	-	-	-	-
Xiobium + Vanadiam + EX ₁	2-#	-	-	-	-	-	-	-	1357	-	1350	-	-	-	-	-
Mohiam + Zirconima	2-1	-	-	-	-	-	379	381	ૠ	-	345	-	357- 365	-	-	-
Mishing alloys (special den a.)																
5 X 0 - 5 ∀ - 2 r	2-II	-	-	-	-	-	-	2321	-	1325	-	-	-		-	-
27 Ta - 12 W - 0.5 Zr	2-2	-	-	-	-	-	-	1329	-	1333	-	-	-	-	-	-
19 Ti - 5 Zr	2-11 2-11	-	-	-	-	-	-	i339	-	1345	-	-	-	-	-	-
16 W - 5 Zr	2-II	_	_	-	_	-	-	1343	-	1353	-	-	-	-	-	-
15W-5Mo-1Zr	2-D	_	-	-	-	-	-	1349	-	1353	-	-	-	-	-	-
15 W - 5 Mo - 1 Zz - 9.5 C	2-II	-	_	_	_	-	-	1369	-	1353	_	_	-	-	-	-
	2- <u>Fi</u>	-	-	-	-	-	_	-	_	-	1327.	-	_	_	-	-
Cb-752	2-교	_	_	_	-	_	_	1349	-	_	1359					_
	2-11	-	_	_	_	_	_	1349	_	_	1255				_	_
Ferroniohóum	2-E	-	-	-	-	-	-	1317	_	-	-	_	_	_		
FS-82	2-11	-	-	-	-	- 1	-	-	_	-	1335	-	_	_ !		_
FS-<28	2-2	-	-	-	-	-	-	1329	-	-	1335	-	٠- ا	-	-	-
FS-85	2- <u>11</u>	-	-	-	-	-	-	-	-	-	1335	-	-	-	-	-
	2-II	-	-	-	-	-	-	-	-	-	1305	- j	-	-	-	-
Nobium aluminide (NAI ₂)	6-1	-	21	-	-	-	-	-	-	-	-	-	- [23	-	-
Nichiam aluminide costing on nichiam	6-D	-	-	-	-	-	- [-	-	-	-	-	-	1453	_	-
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Material Name	Volume	Density	Melting Point	Heat of Fur. on	dient of	Heat of Rabifmation	Steetrient Resistivity	Hpecific float	Thermal Combolivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emissance	Thermal	Therma!	Value Pressure
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%8e ₂₁	6-3	-	101	-	-	i -	-		I _	_		_		l		
Nh3e ₂₂	64	ļ -	100	-	-	-	1 -	119	1112	_]	114	-	115	130		i Ī
Mb ₂ Be ₂₂	6-1	-	-	-	-	-	-	-	112	-	-	-	116	220	_	
Nietium borides Nhs							l						115			l
34.8.	64	-	154	-	-	-	-	-	-	-	-	-	-	-	-	-
	6-1	134	194	i -	-	-	-	196	-	-	195	-	200-	-	-	-
36 ₃ 8 ₂	64	-	196	-	-	-	-	-	-	-	- 1	_	-	_	١.	1 _
ShyB _k	6.3	-	194	-	-	-	-	-	-	-	-	-	-	_	_	-
Nishizm (di-;horide + Zircozian (di-)horide	6-1	-22	į _	I _	_					i l	i					
Niohien cathide (MiC).	5	31	91	-] -	1 -	- 20	95-	90] -		-	-	-	-	j -
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Nichiam-chromium intermetal- lics (NbCr ₂)	6-1	- 1	[584	_	_	_	_	_		_						l
Nichtern-cobalt intermetallics								-			-	-	-	-	-	-
(XECQ)	H	-	GH.	-	-	-	-	-	-	-	- !	-	-	-	-	-
Nichtum ferride (Mre ₂) Nichtum germanides	6-I	-	366	-	-	-	-	-	-	-	-	- 1	-	-	-	-
1	6-1	3223	222								ļ	ı				
1	5-1	-	323	-	-	-	-	-	327	-	-	-	-	-	-	-
	6-1	323	223	_	_	_	_	_	-	-	-	-	-	-	-	-
Nichian germanide stilicides								_	-	-	-	-]	- }	-	-	-
(MiGe ₂ Si ₁₋₂) Nishium-manganese intermetal-	6-1	-	-	-	-	-	-	-	220	- Į	-]	- [-	- 1	-	-
lics (North)	5-2	-	634	-	-	-	_	-	_	_	- 1			l		
Niobium attrides						i				-	-	-	-	-	-	-
I I	5	535	535	-	-	-	537	-	-	-	539	-	-	_	_	_
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Niobius ocides XhO	, , Í									Ì		1	I	ĺ		
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	44	313	-	313			<u> </u>	317	- [- [-1	-	-	- j	-	-
Niehium (pent-)axide +	ļ		ı				_	- i	-	-	321	-	- [-	-	-
	44	-	767	- [-	- [-	- j	-	- }	æ	- !	-	-	- 1	-
Nichium (pant-)enide + + Berylliam onide	44	- [771	_	_	_	_	_		1			-	ı		
Nielstum (pent-) exide +		l		1		-	_	-	-	-	-	-	-	-	-	-
1	44	-	773	-	-	-	- 1	-	-	-	- !	-	-	-	- Ì	_
Nichtum (pont-)exide + + Theorem (di-)exide	44	-	775	-	_	_ [_		_ [- [- 1	i	ı	
Nichaum (pent-)-pride +		- 1	ĺ	- 1	1		_ [-	-	-	333	-	-	-	-	-
	4	-	773	-	-	-	-	-	-	-	782	-	-	-	-	_
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
liobium silicides																
NbSi ₂	6-I	-	-	-	-	-	527	-	529	-	-	-	-	-	-	-
Nb _a Si	6-I	- 1	457	-	-	-	-	- 1	-	-	-	-	-	-	-	-
Nb ₂ 3i ₂	6-I	-	457	-	-	-	-	-	-	-	459	-	_	-	-	-
Penta-) niobium (tri-) silicide + + (Di-) molybdenum boride	6-1	-	724	_	-	-	-	-	-	-	-		-	-	-	_
Nobium silicide germanides					ĺ							·				İ
NbSiGe	6-I	-	-	_	-	-	317		319	_	-	_	-	-	_	۱.
NbSi _{1-x} Ge _x	6-I	-	-	-	-	-	317	-	319	-	-	-	-	-	- '	۱ -
Viobiura stannide (Nb ₂ Sn)	6-I	-	541	-	-	-	-	-	-	-	-	-	-	-	-	
Viobium telluride (NbTe ₂)	6-1	-	-	_	-	-	606	-	608	-	-	_	-	_	-	
Noblum-zirconium alloy conted with barum titanate	6-11	_	-	-	_	-	-	-	-	-	-	_	1369	_	-	
liobium-zirconium alloy coated with boron	6-11	-	-	-	_	-	_	-	-	-	-	-	1291	••	-	
iobium-zirconium alloy coated with calcium titanate	6-11	-	-	_	_	-	-	-	-	-	-	-	1371	-	-	
iobium-zirconium alloy coated with iron titanste	6 -II	-	_	-	_	-	_	-	-	-	-	-	1385	-	-	
Mobium-zirconium alloy coated with nickel chromite	6-II	-	-	_	-	-	-	_	_	_	-	_	1387	_	-	
Nobium-zirconium alloys coated with silicon carbida	6-11	-	_	-	_	-	-	-	-	_		_	1415	_	_	
Nodular cast iron	3	-	-	-	-	-	-	-	3½ 37, 437	} -	41, 444	-	-	-	-	
Sodular cast iron, ferritic base.	3	-	_	_	-	-	_	_	37	_	_	_	_	_	_	١.
fodular cast iron, pearlitic base	3	_	-	_	-	-	_	_	35	_	41	_	_	-	_	
ýycar PA-21	6-II	1051	-	-	-	-	-	-	-	-	-	-	-	-	-	Ι.
Tylon	6-II	-	-	-	-	-	_	1047	-	-	1049	-	-	-	-	١.
Nylon 1 N fabrics	6-1	-	-	-	۱ -	-	-	-	-	1273	-	-	-	-	- '	1
tylon 6	6-11	-	-	-	-	-	-	1047	-	-	1049	-	-	١.	-	l
Sylon 9	6-11	-	-	-	-	-	-	-	-	-	1048	-	-	-	-	
tylon 11	6-11	-	- '	_	-	-	-	-	-	-	1049	-	- '	-	-	
Sylon 11 N fabric	6-11	_	-	-	-	_	_	-	-	. 3	-	-	-	-	-	l
lylon 66	6-П	-	-	_	-	_	-	-	_	-	1049	-	-	-	i - i	1.
lylon fabric	6-11		-	-	-	-	-	-	-	1273	-	-	-	_	ا -	١.
fylon FM-1	8-2	_	_	-	-	-	-	-	-		1049	_	-	_	-	١.
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OFHC copper Copale (fiber cloth	Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of	Heat of	Electrical	Specific Heat	Thermel	Conductivity	Thernal Diffueivity	Thermal Linear Expansion	Thermal Absorptance	Thernal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Commitme	0			1		1				T	\top				-	74	44	
Organic fiber cloth Omium (Os) 1 744 744	OFHC copper	1	_	-	_	1_		1		1		I	ı					
Demilian (Os)	Opaion 300 FM	6-П	-	1076	_		l	1	-	4	58	460	-	-	-	-	-	-
Palatinol Ail Palladium (Pd) G-II 752 752 754 756 758 758 756 764 764 764 764 765		6-11	_	-	-	-	I		-	-	٠	-	-	-	-	-	-	-
Palatinol AH Paliadium (Pd) 1 752 752 - 754 /56 758 - 760 762 766 - 764 765 765 758 - 760 762 766 - 764 765 765 765 765 766 766	Osmium (Os)	1	744	744	-	-	l	746				-		-	-	-	-	-
Palladium (Pd) 1 752 752 76 1086 - 760 782 766 - Palladium + Cobalt + EXi 2-II 1363 - 1336 1366 1366 1366 1366 1366 13	P			1						"	"	-	-	-	750	-	-	-
Palladium + Cobait + EX ₁ 2-II - 1363	Palatinol AH	_							1		ĺ			- 1	- 1	- 1		ı
Palladium + Cobalt + EXi	Palladium (Dd)	- (-	-	-	-	-	-	108	6	-	- 1	_	_	- 1	- 1	- 1
Pulladium + Copper + EK ₁ 2-II 1363 - 1376 - 1376 - 1372 1372 1378		١ ١	752	752	-	-	-	754	756	75	8	-	-	780		I	-	-
Pilladium + Copper + EXt 2-II 1370 - 1386 1372 1378 1378 1378 1378 1378 1378 - - 1378 - - 1378 - - - 1378 - - - 1378 - - -	Palladium + Cobalt + ΣX_i	2-11	-	1363	_	_			1				İ	′∞		766	٠ ا	-
Palladium + Nickel + EXi						_	- 1		-	-	'	-	-	- 1	-	-	-	-
Palladium + Nickel + EXi	Palladium + Gold + T.X.		i	- 1	-	-	-	-	1372	-	Ι.	.	_	_			- 1	_
Palladium + Nickel + EX 2-II 7 393 7 7 1378	FP8110riinum d. 327 - 2 a		i	_ [-	-	-	1376	-	-	.	.	_	- 1		-	-	-
Palladium + Uranium 2-1 393 1378 1378 Palladium aluminides PAMA1 6-I 43	Palladium + Malan - To	- 1	- 1	-	-	-	-	391	-	-	-	.	_	- 1		-	- 1	-
Palladium aluminides PAI PAI PAI PAI PAI PAI PAI PAI PAI PAI	Delladium		- 1		-	-	-	-	-	-	1 -	. 13	78	- 1		- 1		-
PdAI 6-I 43	Palladium aluminides	٦	-	393	-	-	-	- [-	-	-			ł	- 1	-	-	-
Palladium beryllides	PriA1	ا ب	.		- 1	- 1	- 1	- 1	ı		!		-			-	-	-
Palladium beryllides PdBe PdBe PdBe PdBe PdBe PdBe PdBe PdBe	Pd,A1	-	- 1		- 1	-	-	-	-	-	-	1.	-	-	_			- 1
PdBe 6-I 158 -<	Palladium beryllides	•		43	-	-	- [-	-	-	-	. .	- 1 .	-	_	1	I-	-
PôBen 6-I 158	PdBe 6-	,	_	150	- 1	i	ı	1	- 1		1				- 1		-	-
Palladius brazing alloy GE-76 . 2-II	PaBen 6	- 1		- 1	- 1	-	-	-	-	-	-	-	. .	-	-	_		
Palladium tellurides PdTe PdTe PdTe; Color Colo	Palladiwa brazing alloy GE-76	- I	-	1	- 1		-	- 1	-	-	-	-	. .	- .	-	ı	ı	- 1
PdTe PdTe PdTe PdTe PdTe PdTe PdTe Paralex p42	Pallacium tellurides	7			_	-	-	-	-	-	-	137	76 -	. .	- 1	- 1	1	- 1
Parelyte, grade 942	• • • • • • • • • • • • • • • • • • • •	. I.	-	_	- 1	_	- 1				l	ļ	1	1	- 1			1
Panelyte, grade 942 . 6-II 610 1107 1107 1107 1107 1107 1107 978 1107 1107 1107 1107	1 ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '		.	-	- 1	- 1	-	- 1	610	-	-	-	- 1 .	
Perbunan 18 6-II - 1076 978 978	Panelyte, grade 942 6-1	ı -	.	-	-				610	-	-	-	-	· -		ı
Perbunan 18 6-II - 1076 1060		ı -	.	-	-	- 1	- 1		-	-	-	110	7 -	· -	. .	. -	1.	.
Perbunan 26 6-II 1060	16-5	r -	10	76	-	-	- 1		-	-	-	97	8 -	-	- -	. -	1.	.
Periclase Periclase Periclase, synthetic. 4-I Permanickel 300 2-II 1257 Phenol formaldehyde 6-II	[0-1]	ı -		- .	-	- .	.		_	-	-	-	-	-	-	-	-	.
Periclase	• • • • • • • • • • • • • • • • • • • •	r -	1.	- .	-	- .	.]		-	1		-	-	-	-	-	-	1
Periclase, synthetic		-	-	- .	- .	- 1		.		- 1		-	-	1 -	-	-	-	
Permanickel 300	* * * * * * [4-1	-	.	٠ -	. .	- .	. .	- 1	- 1	- 1		1	-	-	-	-	-	1
Phenol formaldehyde	Downson t-1-1 and	-	-	• -	. .	- -	. .	- 1	1	1		-	-	-	-	-	-	1
Phenol formaldehyde 6-II		1257	7 -	· -	. -	. -	- [- 1	- 1		-	-	-	-	-	-	
Phenoi formaldehyde, asbestos filled Phenoi formaldehyde, ceramic filled Phenoi formaldehyde, cord filled 6-II	Phonol Commeller	•	-	-	٠ -	· i -	ı		. '	1	-	1	-	-	-	-	-	
Phenol formaldehyde, ceramic filled Phenol formaldehyde, cord filled 6-II	Phenol formulation	-	-	-	-	-	- 1	J	- 1	- 1	•	Ì	-	-	-	-	-	ı
Phenoi formaldehyde, ceramic filled 6-II		-	1.	1_			-				-	986	-	-	-	-	-	1
Phenol formaldehyde, cord filled 6-II 990 992 992 992	Phenol formaldehyde, ceramic filled			-	-	-	-	-	٠ ٠	-	-	988	-	-	-	-	-	
	• • • • • 16-11		-	-	-	-	-	-	. .	.	_	900	1		1	1 .		1
	6-H	-	-	-	-	-		-	٠ -	.			ł	1	-	-	-	
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffueivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Phenol formaldehyde, cotton flock filled	6-II	-	-	-	-	-	-	-	-	-	994	-	-	-	-	-
Phenol formaldehyde, fabric filled	6-II	-	-	-	-	-	-	-	-		996	-	-	-	-	-
Phenol formaldehyde, stupalith A-2412	6-II	-	-	-		-	-	-	-	-	990	-	-	-	-	-
Pienol formaldshyde, wood flour filled	6-II	-	-	-	-	-	-	-	-	-	998	-	-	-	-	-
Phenolic, alpha cellulose paper reinforced	6-11	-	-	-	-	-	-	-	-	-	1105	-	-	-	-	-
Phenolic, cotton fabric rein- forced	6-11		-	-	-	-	-	-	-	-	1107	-	-	-	-	-
Phenolic, LMI 304 nylon reinforced	6-11	-	-	-	-	-	1103	-	-	-	-	-	-	-	-	-
Phonolic, long glass fiber reinforced	6-11	-	-	-	-	-	1103	-	-	-	~	-	-	-	-	-
Phenolic and epoxide copolymer resin, reinforced	6-11	-	-	-	-	-	-	-	-	-	1126	-	-	-	-	~
Phenolic novolak	6-11	_	-	-	-	-	982 1103	-	-	-	-	-	-	-	-	-
Phenolic, reinforced	6-11	****	_	-	_	-		-	004	1000	1105- 1107	-	-	-	-	-
Phenolic resin	6-II	980 1130	-	-	-	- -	982	- 1132-	994 1148-	1082 1159-	1172-	-	-	-	- -	- -
Phenolic resin, type S	6-11	980	-	-	-	-	-	1146	1156 984	1170 1082	1179	-	-	-	-	-
Phenolite	6-II	-	-	-	-	-	-	-	-	-	1101, 1176	-	-	-		-
NEMA C	6 -11	-	-	-	-	-	-	-	-	-	1107	-	-	-	-	-
NEMA L	%-II	-	-	-	-	_	_	_]] -	1107	-	-	j -	-	-
NEMA LE	6-II 6-II	_					_	_]] _	1107	-	_		_	_
NEMA XP	6-11	_	_	_	_	-	_	_	i _	_	1105	_	_	_	_	_
NEMA XXX	6-II	-	-	-	-	-	-	-	-	_	1105	-	_	-	-	-
NEMA XXXP	6-II	-	-	-	-	-	-	-	; ; -] -	1105	-	-	-	-	-
XXXP	6-II	-	-	-	-	-	-	-	} -	-	1105	-	-	-	-	-
Phenyl silane resin	6-11	-	-	-	-	-	-	1974	-	-	- 1	-	- '	-	-	-
Phenyl silanc resin, reinforced.	6-II	-	-	-	-	-	-	1212	-	1220	-	-	-	-	-	-
Phenyl silane SC-1013 Moneunto	6-II	-	-	-	-	-	-	1074	-	-	-	-	-	-	-	-
Phosphate glass	4-11	1649	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus (pens-)oxide + + Zirconium (di-)oxide	4-I	-	-	-	-	-	-	-	-	-	787	-	-	-	-	-
Pittsburg no. 3235 glass	4-11	-	-	-	-	-	-	1697	-	-	-	-	1705	1709	1711- 1713	-
Plate glass Plate glass nc. 9530	3	1	- -	-	-	-	- -	1791 1791	1783	1793	1797	- -	-	-	-	<u>-</u>
Tano Samo no.																

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Material Name	Volume	Density	Molting Point	Heat of Fusion	Heat of	Went of	Electrical	Resistivity Specific Heat	Thermal	Conductivity	Thermal Linear	Thermal Absorptanc	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Platinum (Pt)	1	768	768	-	-	-	770	77	2 774	7	1-		782-		-	-
Platinum coating on copper	. 6-п	-	-	-	-	-	_	_					788	1		
Platinum coating on quartz	. 6-п	-	-	-	-	_	_				-	-	1313	-	-	-
Platinum coating on stainlers steel	1	İ		1		İ	1		-	-	-	-	-	1317	1319	-
Dietieum	6-II	-	-	-	-	-	-	j -	-	_	-	_	1315	_		
Futurum + Copper	2-1	-	-	-	-	-	350		-	-	-	١.			-	<u> </u>
Platinum + Iron	2-1	_	1.		1		397	1		1			-	_	1	-
Platinum + Rhodium		_	_		! -	-	399	' -	-	-	401	-	-	-	-	-
Platinum arsenide (PigAs ₂)	6-1	_	94	-	-	-	-	-	403	-	-	-	405	407	-	-
Platinum beryllide (PtBen)	1 1	158		-	-	-	-	-	-	-	-	-	-	-	-	-
Platinum siancide (Pt ₂ Sn)	6-1	-	541	-	1	-	-	-	-	-	-	-	-	-	-	_
Platinum sulfides	1			_	-	-	-	-	-	-	-	-	-	-	-	-
PtS	5	_	_	_	_	l	1							1		
PtS ₂	5	- 1	_				-	696	-	-	-	-	-	-	-	-
Platinum tellurides		į		_	-	-	-	638	-	-	-		-	-	-	-
PtTe	6-1	_	_	_	_	ن		!		1				- 1	- 1	
PtTe ₂	6-1	- 1	_	_		_	~	612	-	j -	-	-	-	-	-	-
Plexiglas 11	6-II	-	_	_		_	-	612	-	-	-	-	-	-	-	-
Plemieles Art m		1020	1020	_	_		-	-	-	-	1026	-	-	-	-	
Plutonium (Pu)	1	794	792	_		-	-	102?	1024	-	1025	-	-	-	-	-
Photonium + Cerium + ΣX_i		-	- 132	-	792	^	796	799	-	-	801	-	-	-	-	_ '
Plutonium + Osmium		409	_			-	~	1380	-	-	-	-	-	-	-	- 1
Plutonium + Thorium		411	_	-	_	_	-	-	-	-	-	-	-	-	-	- [
Plutonium beryllide (PuBen)		158	158	_	_	-	-	-	-	-	-	-]	-	- 1	-	-
Dhelanium Laurence	5	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
Pistonium carbides		١	"	3	3	3	-	-	-	-	-	-	-	-	-	5
PuC	5	-	_	_	_	ļ					- 1	-	-		ı	- 1
1 70-0	5	108		_	-	-	110	112	-	-	114	- !	-	-	-	-
The American state of the same of	- 1	327	327	22.	_	-	-	-	-	-	117	-	- [-	-	_
Plutonium ferrides	1			327	327	327	- [-	-	-	- [-	-	-	-	329
PuFe ₂	6-1	306	306	_	_ 1		Į			ı		l	1			
n. n.	1	306	-			_	-	- 1	-	-	-	-	-	-	-	-
Plutonium fluoride (PuF)	5		- 1	389	382	389	-	-	-	-	-	-	-	-	-	-
Pistonium iodide (Puls)				471	471	471	-	-	- !	-	-	-	-	-	-	391
Pantonium-lead intermetallics (PuPb ₂)	I		671			***	-	-	-	-	-	-	-	-	-	473
Plutonium-manganese inter- metallics (PuMng)	- 1		671	_			-	-	-	-	-	-	-	-	-	-
Phatonium-nickel intermetallics	- ; `	·			-	-	-	- [-	-	-	-	-	-	-	-
The No.	-1	_ ,	571	_		l	ł	- 1			1			1		
*	-1	- 1	571	_			-	-	- j	-	-	-	-	- .	-	-
These:	4		572				-	-	-	-	-	-	-	- .	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressuro
Plutonium nitride (PuN)	5	-	-	-	-	-	-	-	_	-	541	-	-	-	-	-
Plutonium-osmium interractallics (PuOs ₂)	6 - I	671	671	-	-	_	_	_	_	-	-	-	-	-	-	_
Piulonium oxides																
PuO	4-I	-	-	-	-	323	-	-	-	-	-	-	-	-	-	329
PuO ₂	4-i	323	323	-	-	-	-	325	-	-	327	-	-	-	-	329
Plutonium silicide (PuSi ₂)	6-1	523	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polonium (Po)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	803
Nolybutadicae Polychlorotrifluoroetaylene	6-11	_		-	_	-	-	-	-	1066		-	-	-	-	-
Polyester, glass floer reinforced	6-II	_	_	_	_	_	_	_	1037	_	1045 1109	-	-	-	-	-
Polyester, unsaturated	6-II	_	_	_		_]		-	368	_	-	-	-	-
Polyester regin, reinforced	6-11	1190	-	-	-	-	-	1191	1195- 1196	1220	1200	-	-	-	-	-
Policeth lene	6-II	1050	-	-	_	_	_	_	1037	_	1045	_	_	_	_	_
Po) "e, halogenated	6-II	1030	-	~ _	_		-	_	_	_	1045	_	_			_
Polyech & PE 575	6-II	-	1030	-	-	-	-	_	_	-	_	_	_	_	_	_
Polyfluor.butyl acrylate rubber.	6-II	1051	-	-	-	-	-		-	-	-	_	_	_	_	_
Polyicoprene	6-II	-	-	-	-	-	-	-	-	1066	-	-	-	-	-	-
Polymethyl methacrylate	6-II	-	-	-	-	-	-	-	-	-	1025	-	-	-	-	-
Polymethyl methacrylate, alumina filled	6-11	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	_
Polymethyl methacrylate, boroa phosphate filled	6-11	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	_
Polymethyl methacrylate, calcium carbonate filici	6-11	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	-
Polymethyl methacrylate, silica filied	6-11	-	-	-	-	-	-	-	-	-	1028	-	-	-	-	-
Polymethyl methacrylate, zinc oxide filled	6-11	-	-	-	-	-	•	-	-	-	1028	-	-	_	-	-
77 77	6 - II	1076	1076	-	-	-	-	1078	1080	-	1088	-	-	-	-	-
Polystyrene	6-11	-	1076	-	-	-	-	-	1090	-	1092	-	-	-	-	-
Polystyrene, Grade 912A	6-II	_	-	-	-	-	-	-	-	-	1092	-	-	-	-	-
Polystyrene foam	6-II	_			_	_ i	-	3005	1090	-	-	-	-	-	-	-
•	6-II	_	-	_	_	-	-	1035 1214	1039 1218	- 1220	1045	-	-	-	-	-
Polythene, germanium (di-)oxide filled	1 1	_	_	_	_		_		1219		1041		İ	-	-	-
	6-11	_	_	_	_	_	_	-		_	1041		-	-	-	-
Polythene, scandium oxide	6-11	_	_	_	-	_	_	-	-	_	1041	_	_	_	-	-
	6-11	-	-	-	-	-	_	-	_	-	1045	-	_	_		_
· ·	6-11	962	-	-	-	-	_	-	264	_	966	_	_	_	-	_
	6-11	-	-	-	-	-	-	970	972	-	_	-	.	_	-	_
Polyvinyl chloride	6-11	-	1076	-	-	-	-	-	1086	-	-	-	- [-	-	-

11.11

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thormal Transmittance	Vapor Pressure
Polyvinyl chloride, cellular	6-11	-	-	•	-	-	-	-	1056	-	-	-	-	-	-	٠
Porcelain	5	1003	-	-	-	-	1005- 1013	1015	1017	-	1019- 1021	-	-	-	-	-
Porcelain 7A2	5	_	-	-	-	-	-	-	1017	-	-	-	-	-	-	-
Porcelain 576	5	1003	-	-	_	-	-	-	1017	-	-	-	-	-	~	-
Porcelain, aluminum oxide	5	1003	-	_	_	_	-	1015	1017	-	-	-	-	-	-	-
Foreclain, cone 14	5	-	-	- 1	-	-	1907	_	-	_	_	-	-	-	-	-
Porcelains, electrical	_	_		_	_		1605									
K-5 body	5 5	_	_	-	_	-	1005 1005	-	-	-		-	-	-	-	-
K-6 body	5 5			_	-	_	1005	-		-	-	-	-	-	-	-
K-7 body	5 5	_			_	_	1005	_	_	-		_		_	-	
K-8 body	5 5	_	_		_	_	1005	_	_	-		_	-	-		-
K-J body	5	_	_	_	-	-	1005	_	_		[_	-	-	-	_
£4-K-1 body	5	_	_	_	_	_	1011	_	_	_	_	_	_	_	_	_
Li-K-2a body	5	-	-	_	_	-	1011	_	_	_	_	_	_	_	_	_
Li-K-2b body	5	_	_	_	_	-	1011	_ ;	_	_	_	_		_	_	_
Li-K-2c body	5	_	-	_	_	_	1011	_ '	_	_	_	_	_	_	_	_
Li-K-2d body	5	_	-	-	-	_	1011	-	_	۱.	_	-	_	_	_	_
Li-a-2e body	5	_	_	-	_	-	1011	_	_	_	_	_	_	_	_	-
Lithium modified	5	_	-	_	_	_	1011	_	_	_	_	_	_	_	_	-
Pelalite body	5	-	-	_	_	_	1011	_	_	_	_	_	_	_	_	_
Porcelain, feldspar, dinnerware	5	_	_	_	_	_	1007	_		_		-	_	_	_	_
Porcelain, zircon	5	1003	_	_	_	_	1013	-	1017	_	1021	_	_		_	
Potaggium aluminum gilicates	4-11	-	_	_	_	_	_		-	_	1316-	_			_	_
Potassium aluminum silicate +											1318					_
+ iron(ic) oxide	4-11	-	-	-	-	-	-	1573	-	-	-	-	-	-	-	-
Potassium borate glass	4-11	1605	-	-	-	-	1607	-	-	-	- 1	-	-	-	-	-
Potassium bromide (KBr)	5	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-
Potassium chloride (KCl)	5	-	-	-	-	-	-	-	-	-	-	- 1	-	331	-	-
Potassium feldspar	4-11	-	-	-	-	-	-	-	-	-	1316-	-	-	-	-	-
Potassium fluoride + Lithium	_					}			1	1	1318	1	•	1		
fluoride	5	-	-	-	-	-	-	409	-	-	-	-	-	-	-	-
Potassium mica	5	į -	-	-	-	i -	-	-	-	-	1001	-	-	-	-	-
Potassium sodium aluminum silicates	4-11	1	-	-	-	-	-	-	-	-	1320	-	-	-	-	-
Potassium uranaie (K ₂ O·UO ₂) .	4		1482	•	-	-	-	-	[-	-	-	-	-	-	-	-
Potassium lead silicate g'sas	1	•	-	-	-	-	1777	-	-	-	-	-	-	-		
Potassium silicate glass	,	1	-	-	-	-	-	-	-	-	1775	-	-	-	-	-
Praseodymiani (Pr)	E .	805		605	805	-	807	509	-	-	-	-	-	-	-	871
Praseodym(am + EX;	2-11	-	1382	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Funion	liest of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffuelvity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emitance	Thermal Reflectance	Thornal Transmittance	Vapor Pressure
Praseodymium + Magnesium	2-1	433	_	-	-	_	_	-	_	ţ	-	-	-	_	_	_
	2-1	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-
Praceodymium + Efform	2-1	-	-	-	-	-	-	417	-	-	-	-	-	-	-	-
Praecodymium alumi, des																
PrA1	6-I	-	43	-	ļ -	-	-	-	-	-	-	-	-	-	-	-
FcAl ₂	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Pral ₄	6-I	-	43	-	-	-	-	-	i - I	-	-	-	-	-	-	-
Pr ₂ Al ₂	6-I	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Praccodymium-bismuth inter- metallics (PrBi)	6-1	673	-	-	_	-	-	_	-	-	_	-	_	-	-	_
Prassodymium boxider																
PrB ₄	6-1	296	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PrBg	6-1	295- 296	-	-	-	-	300	-	-	-	-	-	-	-	-	-
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Prascodymium-cacmium inter- metallics															_	
PrCd	6-1	673	-	_	-	_	-	-	-	_	_	_	_ İ	_	_	_
PrCd ₂	6-1	673	-	-	_	-	-	-	-	_	_	_	_	_	_	
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PrCd _H	6-1	673	-	-	-	-	-	- 1	-	-	-	-	-	-	-	-
Praseodymium carbides								1		Į			ı			
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Praseodymium chloride (Praly).	5	339	-	- 1	-	-	-	-	-	-	-	-	- [-	-	-
Praseodymium-cobalt inter- metallics			i													
PrCo ₂	6-1	673	-	-	-	- [-	-	-	-	-	-	-	-	-	-
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Praseodymium-cepper inter- metallics							l	ĺ			İ					j
PrCu	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	- }
PrCu ₂	6-I	-	673	-	-	-	-	-	-	-	-	-	-	-	-	-
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Prascodymium-gold intermetal- lics		Į		ļ							ļ					
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Material Name	Volume	Density	Melting Point	liest of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermu! Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Therma! Emittance	Thermal Reflectance	Therinal	Vapor Pressure
Prasoodymium-gold inter- metallics (cont.)												14	1.8	HE	14	**
PrAu,	6-1	-	673	-	-	-	! _	۱.	_	_						ļ
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Praseodymium hydride (PzH ₂) . Praseodymium-indium inter- metallics	5	467	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Praseodymium-lead intermetal- lics	0-1	673	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PrP5	6-1	-	674	-	-	_	_	_					ļ	ļ		ļ
PrPb ₃	6-1	673	674	-	-	_	_			i - I	-	-	-	-	-	-
Pr ₂ Pb	6-1	-	674	-	-	-	_	-		! -		-	-	-	-	-
Prascodymium-magnesium inter- metallics											-	-	-	-	-	-
PrMg	6-1	673	674	-	-	-	-	-	-	_ !	_	_	_	- 1		l
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Pr _a Mg	6-1	-	674	-	-	-	-	-	-	-	_	_	_		_	-
Praseodymium-mercury	6-1	-	674	-	-	-	-	-	-	-	-	_	_	<u> </u>	-	-
intermetallics (PrHg)	1 1	673	-	-	-	-	-	-	-	-	-	-	-	_	_	-
metallics (PrNig)	6-1	673	-	-	-	-	- 1	_	_			- 1	i			
Praseodymium-osmium inter- metallics (PrOs ₂)	6-1	673	-	-	-	_	_ :	_	-		-		-	-	-	-
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Prascodymium phosphide (PrP). Prascodymium selenides	5	635	-	-	-	-	-	-	-	-	-	-	- İ	_	_	
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Praseodymium silicides (PrSi ₂).	6-1	523	-		-	-	-	-	-	-	-	-		-	-	-
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. Material Name	Volume	Denaity	Melting Point	Heat of Fusion	Hent of	Vaporization Heat of	Sublimation Electrical	Resistivity	Specific Heat	Thermal Conductivity	Thermal	Thermal Lincar Expansion	Thermal	Thermal	Thormal	Reflectance	renemittance	AMPOUT PROBLEM
Praecodymina sulfides PrS						Γ	T							+	+		+	_
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Prasondyraium-thallium inter- metallics	5	700	-	-	-	-	-	-	٠	-	-	-	-	-	-	-	-	
PeTi	6-1	- 1	674	_	_	_		1	-						1	i	j	
PrTi _s	6-1	-	674	_	-			į:		-	i -	-	-	-	-	-	-	
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Pyrocerans	<u>-11 16</u>	593	-	-	-	-	-	169	7 1	699	1701	1703	-	1705 1707	1709	1711	-	
	-11	-	-	-	-		-	158	7 1	559	1591	_	-	1593-	1601	1603	_	
Pyroceram 9698	-11	-	-	-	-	-	-	158	7 1:	559	1591	-	-	1599 1593- 1599	1601	1603	_	
Pyroceram 9690	-11	-	- 1	-	_	-	_	_	1.	_	1591 1591	_		1233	1	l	İ	1
Pyrolytic carbon 1	.	83	-	-	-	_	-	_	1	69	_	- 1	-	-	-	-	-	I
Pyrolytic carbon EYX-4 1	-	.	-	-	-	-	-	-	- 1	89	_	_	-	_	-	-	-	ı
Pyrolytic graphite	-	.	-	-	-	-	-	-	ı	17	-	319	-	325- 331	333- 335	-	<u> </u>	Ï
Pyrolytic graphite coating on tastalum	-u -		-	-	-	-	-	-	-	.	-	-	-	1297- 1299	_	-	-	
Pyrolytic graphite + Zircənium (pyro-) carbide	-		-	-	-	-	-	-	-	.	-	745	_	_		_	_	
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Nartz Nartz costed with magnesium fluoride		53 :	353	-	-	-	355	357	3	63	365	-	-	-	379	331	-	
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STATES OF THE PROPERTY OF THE

Material Name	Volume	Density	Malting Point	liest of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Libear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Meflectance	Thermal Transmittance	Vapor F "saure
2																
		1122	-	-	-	-	-	1139	1334	-	1156	-	1194, 1195	1211	-	
Resimence 814 resim	6-II 1	817	1014 817	-	- -	- 817	829	- 822	824	- -	826	-	828-	-	-	- 834
Rhenium + Tungsten	2- I	-	419	-	-	-	-	-	-	-	-	-	532 -	-	-	-
Rhenium arranide (Ro ₂ As ₇)	6-3	-	-	-	-	-	96	-	-	-	-	•	-	-	-	- 1
Rhenium phosphide (ReP)	5	-	635	-	1 _	-	-	-	-	-	-	-	-	-	-	-
Rhenium selenide (ReSe ₂) Rhenium silicides	6-1	-	-	-	-	-	349	-	351	-	-	~	-	-	-	-
ReSi	5-1	-	461	_	_	_	_	_	_	-	463	_	_	_	_	465
ReSi,	6-I	_	461	_	_	_	i _	_	_	_	463	_	_	_	-	445
Re _s Si	6-i	_	461	-	_ 1	_	_	ا ـ	_	_	-	_	_	_	_	465
Rhodium (Rh)	1	835	836	-	-	-	838	540	842	-	-	-	644- 848	£ 56	-	-
Rhodium germanides																
RhGe ,	6-1	323	-	-	-	-	-	-	-	-	-	-	-	- 1	-	-
Rh ₂ Ge	6-1	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rh _f Ge ₄	6-1	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rh _i Ge ₂	6-1	323	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rokide A centing on ASSI 446	6-11	-	-	-	-	-	-	-	-	-	-	-	-	1351	-	-
Rokide C costing on titanium alloy 6 Al – 4 V	6-II	-	-	-	-	-	-	-	-	-	-	-	1345- 1347	-	-	-
Rubbers																
Board so. 2266, cellular	6-II	-	-	-	-	-	-	-	1054	- 1	-	-	-	- 1	-	-
Doma	6-II	1051	-	-	-	-	-	1054	1956	1965	-	-	-	_	-	- 1
Dielectric mix	6-II	-	-	-	-	-	-	-	1956	-	-	_	-	_	_	_
Natural	6-II	1051	-	-	-	-	-	-	1056	1058	1068	-	-	-	-	-
Perbuan	6-II	1051	-	-	-	-	-	1054	1956	1060	-	-	-	-	-	-
Silveene	6-II	-	-	-	-	-	~	-	-	1064	1865	-	-	-	-	-
Symathetic	6-II	1051	-	-	-	-	-	1054	1956	1060- 1066	1068	-	-	-	-	-
Rubidium fluo.ide (RbF)	5	-	-	-	-	-	-	393	-	-	-	-	-	- 1	_	395
1	1	852	852	-	-	852	954	856	858	-	-	-	-	-	-	860
Ruthenium-tungsten intermetal- lics (Bu ₂ W ₂)	6-I	-	684	-	-	_	-	-	-	-	-	_	_	_	-	-
	4-1	445	-	-	-	-	450	454	460	-	462	-	_	-	-	-

SAE 1346 3	Material Name	Volume	Density	Multing Point	Heat of Fusion	lient of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Confuctivity	Thermal Diffusivity	Thermal Linear Expansion	Theresal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
SAE 1916	\$			l													
SAE 1810	SAT 1906	3	_	- 1	-	-	_	-	-	-	322	-	-	-	-	-	-
SAE 1845 3 329 - 345 342 SAE 1846 3 333 335 SAE 1846 3 333		- 1	310	-	-	-	-	312	316	325	329	335	-	-	-	-	-
SAE 1945 3 333 357 358 SAE 3130 3	SAE 1018	ક	-	-	-	-	-	-	-	-	333	-	-	-	-	-	-
SAE 3140 3	SAE 1400	3	-	-	-	-	-	-	-	-	329	-	-		-	-	-
SAE 4349 3 3	BAE 1945	3	-	-	-		-	-	-	-	333	-	-	-	-	-	-
SAE 939	SAE 3140	3	-	-	•	~	-	-	-	-	365	-	-	-	-	-	-
SAE 64300	SAE 4136	3	-	-	-	-	-									t i	-
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Samarium carbides SamCd ₁₁	SmCd	6-2	631	-	-	-	-	-	-	-		-	-	-	-	-	-
Samarium carbides	SanCol ₂	6-1	581	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Smc2	•-	6-1	681	-	<u> </u>	-	- 	j -	-	-	-	-	-	-	-] -	-
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Samarium ferrides SacFe;	-			-	-	-	_	-	-	-	-	<u>.</u>	-	-	-	-	-
SmFe; 6-1 3a6	·					!	1	1		1	Į	1			I		1
Samarium gallium intermetallics Samarium garmanide (SmGe ₂) Samarium garmanide (SmGe ₂) Samarium hydrides SmH ₂		6-1	346	i -	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium garmanide (SmGe ₂) 6-1 323		5-1	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samarium germanide (SmGe ₂) 6-1 323	Semarium-gallium intermetallics	رء	241		_	_	_	١.	1 -	1 -	_	_	1 -	-	-	-	-
Samarium hydrides SmH2 5 467				i -] -	-	_	1 -	_	-	-	-	-	-	-	-	-
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Samarium-indium intermetallics (Smln ₂)	-	5	457	-	-	1 -	i -	j -	-	-	-	-	-	-	-	-	-
Samarium-indium intermetallics (Smln ₂) 6-1 631	=	1 1	_	<u> </u>	-	-	-	-	-	-	j -	j -	-	-	-	-	-
Samarium-lead intermetallics (SmPby) 6-I 691	Samarium-indium intermetallics	6-1	631	-	-	-	-	-	-	-	-	-	-	-	Ì -	-	-
Samarium-mercury intermetal-	Samarium-lead intermetallics	i		-	-	-	-	-	-	-	-	-	j -	-	-	-	-
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	lics (Smlig)	€-1	601	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Material Name	Volume	Numbity	Melting Point	liest of Fusion	tient of Vapolization	Heat of Hubilmation	Riestriuni Resistivity	Hwellte Heat	Therinal Commetivity	Thermal Diffuelvity	Thermal Linear Expansion	Therm: Absorptance	Thermal Emiliance	Thermal Reflectance	Thermall 1 ransmittance	Vapor Pressure
Samazium-nickel intermetallics														Ì	Į	
Smills	6-3	641	-	-	-	-	-	-	-	- 1	_	-	-	_]	- 1	_
SmXi,	يىء	531	-	-	-	-	-	- 1	-	-	-	-	-	-	- 1	-
Samarium (susqui-)otide (Sm ₂ O ₂)	4-3	335	339	_	-	_	_	301	_	-	363	_	345	_	_	_
Seznarium (sesqui-) oxide +															-	_
+ Gadolinium oside Samarium (seogui-)oside +	4-1	-	- [-	-	-	-	_	793	-	-	-	-	-	-	-
+ Gadolinium exide + + Drzervalica oxide + Yitrium	li														1	
crise	4-3	785	-	-	-	-	-	-	-	-	-	-	-	-	- 1	_
Samarium phosphide (SmP)	5	æ		-	-	~	-	-	-	-	-	-	-	-	-	-
	6-3	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semarium allicides (SmSi ₂)	6-3	525	-	-	-	-	-	-	-	-	-	-	-	-	- [-
Sanarius sullides																
Sas _{la}	5	-	-	-	-	-	386	-	793	-	-	-	-	-	-	-
SetS	5	764	794 794	-	-	-	-	-		-	-	-	-	-	-	-
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SmyS ₂	5	704	701	_	-	_	_	_	_	_		_	<u>-</u>	-	_ [_
Staduich pracis, TAC-polyester akin and alkyd isocyanate from core	6-E	-	-	-	-	-	-	1257	1259	-	-	-	-	-		-
Sagaire	4-1	41	40	-	-	-	43	5	45	-	47	-	-	-	-	-
Sappkire, symbolic	5-1	41	-	-	-	-	-	8	45	-	-67	-	-	-	-	-
Scredia	4-1 1	347 848	347 966	- 863	- 943	- 968	579	369 572	-	-	द्धाः ऋ	-	-	-	-	871
Scandium (Sc)	6-1	204	204	-	-				-	-	205	-	-	-	-	613
Scandings carbide (ScC)	5	234	-	_	_	_	-	-	-	-	-	<u> </u>		-	-	-
Scanding sitride (SeX)	5	621	-	_	-	_	-	-	-	_	_	-	-	-	_	_
Scandouse oxide (So ₂ O ₂)	44	367	347	-	<u> </u>	-	-	389	-		363	-	-	_	_	-
Scandina selmide (So ₂ Se ₂)	6-1	365	-	-	-	-	-	-	- 1	-	-	-	-	_	_	_
Scandium sullide (So ₂ S ₂)	5	732	-	-	! -	-	-	-	-	- 1	-	Ì -	-	-	-	-
Scandium telluride (SojTey)	64	es.	-	-	-	-	-	-	-		-	-	-	-	-	-
Selectron 209	6-E	1030	-	-	-	<u> </u>	-	-	-	-	1336	i -	-	-	-	-
Selectron 5006	6-22	-	-	-	-] :	-	-	-	-	463	-	-	-	-	-
St 142 silicon	1	-	-	-	1	-	-	-	-	330	-	-	-	-	-	-
Stiastic 100	6-E	-	_	-	-	<u>`</u>	-	-	-	3454	1000	-	-	-	-	-
Silestic 190	6-E 4-1	- 353	353	-		-	753	357	350	363	357	-	373	377	•	-
Aller				! -	İ	-	~					-	375		-	-
Silies fabric	6-B	[-	-	-	-	-	-	-	-	1277	-	-	-	-	-	-
Silica glass	14-2	3651	1651	-	-	-	1623	Mess	KEL	1659- 1861	1963	i -	3467	2200	1671- 1673	-
Siljes rock	44	534	! _	! _	1_	l _	Į	f .	_	i	i	į	1	١.	l i	i

Material Name	Volume .	Density	Melting Point	Heat of Fusion	Heat of Vuporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermul Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Silicide coating on molybdenum .	6-11	-	-	•		-	-	•	•	-	•	,	1467- 1469	1471	-	-
Silicide coating on tantalum	6-11	-	-	-	-	-	-	-	-	-	-	-	1473- 1475	1477	-	-
Silicide coating on titanium	6-II	-	-	-	-	-	-	-	-	-	-	-	1479- 1481	1483	-	-
Silicide costing on tungsten	6-11	-	-	-	-	-	-	-	-	-	-	-	1485- 1487	1489	-	-
Silicon (Si)	1	878	878	878	-	878	880-	886	888	890	892	-	894- 896	898	-	-
Silicon + ΣX_i	2-11	- 1	-	-	-	-	1384	1386	_	-	-	-	-	_		_
Silicon + Germanium	2-I	421	-	-] .]	_	-	-	-	-	-	_	-	_	-	_
Silicon + Iron	2-1	-	-	_ '	_	_	- 1	423	425	-	427	-	_	_	-	_
Silicon alloys (special designations)																
Leboite	2-1	-	-	-	-	-	-	-	-	- 1	427	-	- 1	-	-	-
Silicon borides					į			ł	l				1			
SiB ₄	6-I		-	-	- :	-	-	-	-	-	210	-	-	-	-	-
SiB ₆	6-1	-	208	_	} -	-	-	} -	-	-	210	_	-	-	-	-
Silicon carbides	1			ĺ			i		}					}	į	
(sic)	5	119	119	-	-	-	121	123	125-	-	129	-	.:31- 135	137-	-	-
Norton RC-4237	5		-	_	_	-	_	_	127	_	-	-	311	139	_	-
Silicon carbide coating on niobium-zirconium alloys	6-17	_	_	_	_	_	_	_	_	_	_	_	1415	_	_	_
Silicon carbide coating on tantalum	6-11	-	-	-	-	-	-	-	-	-	-	-	1411- 1413	-	-	-
Silicon carbide + Boron carbide .	5	297	_	_	i -	_] _]_	-	-	299	_	_	} -	-	-
Silicon carbide + Carbon	5	_	1 -	-	-	_	-	807	-	_	809	_	811	_	-	_
Silicon carbide + Graphite	5	-	-	l -	-	l -	-	813	١.	-	-	-	-	١.	-	۱.
Silicon carbide + Graphite + Silicon	5	-	-	-	-	_	_	815	817	-	-	_	-	_	-	-
Silicon carbide + Magnesium oxide + Nickei aluminide cermet	6-11	_	_	_						_	854	_				
Silicon carbide + Silicon	5	_	-	-	_	_	-	819	_		~		821	Ī _	_]
Silicon carbide + Silicon cermet.	1	_]					819	856	-	۱ <u>-</u> ۱] _	""]]]
Silicon carbide + Silicon nitride .	1 :	! •	-		-	i]	_	000]	823	! -	_	-]]
Silicon carbide + (Tetr-) boron		297								-		ĺ]	-		
carbide \dots . Silicon carbide $+ \sum X_i \dots$.	5	-	-	-	-	-	-	-	307	-	239	-	309- 311	-	-	-
Silicon carbide foam	5	-	-	-	-	-	-	-	127	-	129	-	-	-	-	-
Silicon gumanide (SiGe)	6-1	-	-	-	-	-	-	405	-	-	-	-	-	-] -	-
Silicon oxides	1) }]				1		· !	l	ļ	1]	ł	1	
SiO	4-1	-	-	-	-	-	-	-	-	-	-	-	371	-	-	-

Material . Name i	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Silicon oxides (cont.)	4-1	353	353	-	-	-	355	357	359- 361	363- 365	367- 369	-	373- 375	377- 379	381	-
Silicon (di-) oxide coating on aluminum	6-II	_	_	-	_	-	_	_	-		_	-	-	1391	-	-
Silicon (di-) oxide foam		-	-	-	-	_	-	-	_	-	369	-	_	-	-	-
Silicon (mon-) oxide coating on aluminum		_	_	_		_	_	_	_	_	303		_	1389	-	
Silicon (di-) oxide + $\sum X_i$		826	_	_							_			1005		
Silicon (di-)oxide - Aluminum	6-II	-		-	_	-	-	_	_	_	790	_	_	_	-	_
Silicon (di-)oxide + Aluminum oxide + Calcium oxide		_	_	-	-	-	-	-	-	796	-	-	-	-	-	-
Silico-: (c')oxide + Aluminum oxide	4-I	-	-	-	-	-	-	-	-	789	792	-	794	-	-	-
Silicon (di-) oxide + Aluminum oxide + Iron(ic) oxide	4-I	-	-	-	-	-	-	-	798	800	802- 812	-	-	-	-	-
Silicon (di-)oxide + Aluminum oxide + Iron(ic) oxide + + Magnesium oxide + Potassium (mon-)oxide	4-I	_	-	-	-	-	-	-	814	-	-	-	-	-	-	-
oxi:- Silicon (di-)oxide + Carcium Oxide + Carcium	4-1	-	-	-	-	-	-	-	816	818	-	-	-	-	-	-
oxide	4-1	820	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (di-)oxide + Molybdenum (di-)silicide	5	-	-	-	-	-	-	-	-	-	-	-	783- 785	787		-
Silicon (di-)oxide + Titanium (di-)oxide	4-I	-	-	-	-	_	822	-	-	-	824	-	-	-	-	-
Silicon nitride (Si ₂ N ₄)	5	543	543	-	~	-	-	545	517	-	549	-	551- 553	555	•	-
Silicon nitride + Silicon carbide.	5	840	-	-	-	-	-	-	-	_	-	-	-		-	-
Silicon telluride (SiTe)	6-1	614	614	-	-	-	616	-	640	-	-	-	-	-	-	-
Silicone DC-301	6-11	-	-	-	-	-	1113	-	-	-	-	-	-	-	-	-
Silicone GMGA 5003	6-II	-	-	-	-	-	1070	-	-	-	-	-	-	-	} -	-
Silicone coating on Inconel	g. ⊒	-	-	-	-	-	1495	-	-	-	-	-	-	-	-	-
Silicone, filled	6-11	-	-	-	-	-	1070	-	-	-] -	~	-	-	-	-
Silicone, reinforced	6-D	-	-	-	-	-	1313	-	-	-	-	-	-	-	-	-
Silicone foams						l										
Silicone foam R-7001	6-11	1084	-	-	-	-	-	-	1080	-	-	-	-	-	-	-
Silicone foam R-7002	6-II	1084	-	-	-	-	-	1072	1980	-	-	-	-	-	-	-
Silicone foam R-7091	6-II	1084	-	-	-	-	-	-	1080	-	-	-	-	-	-	-
Silicone resin		-	-	-	-	-	-	1072	-	-	-	-	-	-	-	-
Silicone resin, reinforced		1204	-	-	-	-	-	1206	1208, 1218	1220	1210	-	-	-	-	-
Sillimanite	4-11	-	-	-	-	-	-	1169	-	-	1195	-	1299	-	-	-
				L							<u> </u>					

Máterial Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Registivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Silver (Ag)	1	900	900	900	900	900	902	904	906	-	908	910	912~ 914	916- 920	-	922
Silver coated with silver sulfide.	6-11	-	-	-	-	· -	-	-	-	-	-	1433	1435	-	-	-
Silver coating on mylar	6-11	-	-	-	-	-	-	-	-	- 1	-	-	-	1325	-	-
Silver lume	1	-	-	-	-	-	-	-	-	-	-	910	-	-	-	-
Silver + Aluminum	2-I	431	- 1	-	-	429	433	- 1	-	-	-	-	-	-	-	-
Silver + Cadmium	2-1	-	-	-	-	-	-	-	435	-	-	-	-	437	-	439
Silver + Copper	2-I	-	-	-	-	-	-	-	-	-	441	-	-	-	-	_
Silver + Gold	2-1	-	-	-	-	-	-	-	-	-	443	-	-	-	-	445
Silver + Lead	2-I	-	-	-	-	-	-	-	_	-	447	-	-	-	-	-
Silver + Magnesium	2-I	-	-	-	-	-	-	-	-	-	_	-	_	-	-	449
Silver + Manganese	2-1	_	_	_	-	_	451	_	_	-	_	-	_	_	_	_
Silver + Palladium	2-1	-	_	-	_	_	458	_	_	-	_	-	-	-	_	_
Silver + Platinum	2-1	_	_	_	_	١.	455	_	_	_	_	_	_	_	_	_
Silver + Zinc	2-1	459	457	457	_	_	-			_	_	_	_	461	_	_
Silver antimony telluride (AgSbTe ₂)	6-I	-	_	_	_	 -	620	-	-	622	-	_	_	_	-	-
Silver antimony telluride + + Germanium telluride	6-1	-	-	_	_	-	719	-	-	_	_	_	_	-	-	-
Silver antimony telluride + + Tin telluride	6-I	-	-	-	-	-	-	-	721	-	-	-	_	-	-	-
Silver beryllide (AgBen)	6-I	158	-	-	-	-	-	-	-	-	-	-	i -	-	-	-
Silver bromide (AgBr)	5	-	-	-	*-	-	-	-	-	9	-	-	-	-	-	-
Silver indium telluride (AginTe ₂)	6-I	_	_	_	_	_	624	_	640	_	_	_	_	_	_	
	4-1	_	_	_	_	_	-	383	-	_	_	_	۱.	_	_	-
Silver oxide (AggO)	6-11	_	_	۱.	_	١.	l _	-	_	_	l _	۱.	۱.	1321	_	۱.
Silver plated AISI 321	6-1		l		_			353	355	_						_
Silver selenide (Ag ₂ Se)	1	-	_		1 🗆		-	710	-	[[1]		-	
Silver sulfide (Ag ₂ S)	5 c #	-	-		l _	_ ا	-	- 10			<u> </u>	1431	1433	_	-	
Silver sulfide costing on silver .	6-13]	-			-	_	618		-		-	1			[
Silver telluridos (Ag ₂ Te)	6-1	l	1	-		-	-	010		-	-		1809	1811	1613-	1]
Soda lime glass	4-11	-	-	-	-	-	-	-	ļ -	-	-	_	100	1011	1815	-
Soda iime aluminozilicate glass.	4-11	-	-	-	-	-	1817	-	-	-	-	-	-	-	-	-
Soda-lime silicate glass	4-11	-	-	-	-	-	-	1791	1795	1793	1797	-	1799	1801	-	-
Socia lime glass LOF	4-11	-	-	-	-	-	-	-		-	-	-	1809	1811	1813- 1815	-
Sodium cluminum borate glass .	4-11	-	-	-	-	-	-	-	-	-	1527	-	-	-	-	-
Sodium aluminum silicates (Na ₂ O·Al ₂ O ₃ ·4 SiO ₂)	4-11	-	-	-] _	-	-	1324	-	-	1326	-	-	-	-	-
Sodium barium silicate glass	4-11	1	-	-	-	-	-	-	-	-	1789	-	_	_	-	_
Sodium beryllium borate glass .	4-11	1	_	-	-	-	-	-	-	-	1629	ł .	-	_	-] _
Sodium borate glass	4-11	I	-	1 -	-	_	1607	_		_	-	-	-	_	ļ <u>.</u>	۱.
	4-11	l .	-	_	_	_	-	-	_	-	1721	_	_	-	-	_
Sodium borosilicate glass			İ													

Sodium calcium allicate Sodium ferrite (Na ₂ O · Sod	Material Name	Volume	Denaity	Melting Point	Heat of Fusion	Heat of	Heat of	Electrical	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Sodium ferrite (1840) Fe-00) 4-11 - 1799 1801 - 1801 -	Sodium calcium silicate (Na ₂ O·CaO·SiO ₂)									+	-		77	HM		44	+ ×
Sodium fluoride + Seryllium ferrite cermst		1 -	- I		1	-	1	i	1328	-	-	-	-	-	-	-	-
Sodium fluoride + Beryillium Furride cerms	Sodium ferrite (Na ₂ O·Fe ₂ O ₃)	- 1	-;			1	-	-	1	1795	1793	1797	-	1799	1801	-	-
Sodium fluoride + Zironium (totra-) fluoride Zironium fluoride Zironium fluoride Zironium fluoride Zironium fluoride Zironium magnesium borate glass 4-II	Sodium fluoride + Beryllium						-	-	1097	-	-	-	-	-	-	-	-
Sodium magnesium borate glass	fluoride + Uranium (tetra-)							-		\$11	•	-	-	-	-	-	-
Sodium magnesium borste glass 4-II -	Sodium lead silicate glass	i	i	i		1	-		1	-	-	-	-	-	-	-	-
Sodium magnesium silicate glass 4-II		. 4-11	i	١.			-	1	j	-	-	1803	-	-	-	-	-
Socium magnesium copper silicate glass	Sodium magnesium silicate glas:	4-11	-	-	_	1		-	1	-	-	1631	-	-	-	-	-
Sodium manganese telluride	Socium magnesium copper	1	1	_	_		_	-		-	-	1805	-	-	-	-	-
Sodium molybdates Na ₂ O·MoO ₃ 4-II	(Na _X Mu _{1-X} Te)	6-1	-	-						-		1867	-	-	-	-	-
Na ₂ O · 2 Mo ²					1			626	-	628	-	-	-	-	-	-	-
NagO - 2 MoO NagO NagO NagO - 2 MoO NagO - 3 MoO NagO		4-11	-	-	-	_	_								- 1		
Sodium phosphorus uranate (2 NaC UQ · P ₂ Q ₂)			-	-	_	-	_			ľ	- 1		-	-	- [-	-
Candium potassium aluminum allicates	Sodium (mon-)oxide (Na ₂ O)	4-1	-	-	-	-				Į		- 1	-	-	-	-	-
Sodium potassium aluminum silicates	(2 NaO·UO ₃ ·P ₂ O ₃)	4-11	_	1482	-				ı	-		-	-	-	-	-	-
Sodium potaesium borosilicate glass	Silicates	4-II	_	_			-		-	-	-		-	-	-	-	-
Na ₂ O · SiO ₂	Enere	4-11	_	.	_			ļ	-	-			-	-	-	-	-
Na ₂ O · 2 SiO ₂	odium silicates	1 1				_	-	i	-	-	-	1723	-	-	-	-	-
Na ₂ O · 2 SiO ₂	Na ₂ O·SiO ₂	4-11	-	_	_	_	_ [l	ļ			- 1	- 1	- 1	
1782 -		4-II	-	-	-	1	_		1	-	-	-	-	-	-	-	-
ocium silicate glass no. 23 4-II 1791 1787	odium silicate glass	4-11	1779	-	_	_	1	1781		-		- 1	-	-	-	-	-
odi.vra stronium al'amino- siliate giass	O'Young all and a day				l			****	-	1783			-	-	-	- [- [
odium tellurate (Na ₂ O·TeO ₂) . 4-H 1366 1821	diem strontum slamino-		-	-	-	-	-	-	1791	-	ı	-	-	-	-	-	-
Odium titanates Na ₂ O·TiO ₂ 4-II 1454			-	-	-	-	-	-	-	- 1	- 11	821	.	_	_	- 1	l
Na ₂ O·TiO ₂	••	4-11	-	-	-	-	-	-	1366	-	- -	_	_]		_	-	-
Na ₂ O·2 TiO ₂	N- 0			1			Í					İ	- '		_	-	-
Na ₂ O·3 TiO ₂			-	-	-	-	-	-	1454	-	-	- 	_	_	_ [
Na ₂ O·2 WO ₃			-	-	-	-	-	- [:	1454	-	-	- .	- 1	}	.	_	_
Na ₂ O·WO ₂ 4-II 1480		11	-	-	-	-	-	- :	1454	-	-	- 		[]
Na ₂ O · 2 WO ₃ 4-II 1480	V- 0 710		_					ł				1					_
dium tungsten oxide (Na _x WO ₂), 4-II	V- 0 0		_	1	-	-	-	- 1	L480	-	-	- -	. -	_
dium uranate (Na ₂ O·UO ₂) 4-II - 1482 1155		- 1	_	<u> </u>	-	-	-	- 1	480	-	- .	- -	. -	_
1.1462 - - - - - - - - - -	dium uranate (Na.O-110.)				-	-	-	-	-	-	- 23	55 -	. -	. .	. 1.	.	_
		4	-	1482	-	-	-	-	-	-	- .	- -	. -	١.	.]	.	
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Matorial Name	Volume	Density	Melting Point	Hat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thormal Linear Expansion	Thermal Absorptance	Thermal E: .dance	Thermal Reflectance	Therma! Transmittance	Vapor Pressure
Sodium vanadates																
Na ₂ O · V ₂ O ₅	4-II	-	-	ı -	-	-	-	1494	-	-	-	-	-	-	-	-
2 Na ₂ O · V ₂ O ₈	4-11	-	-	-	-	-	-	1494	-	-	-	-	-	-	-	-
3 Na ₂ O · V ₂ O ₅	4-11	-	-	-	-	-	-	1494	-	-	-	-	-	-	-	-
Sodium zinc borosilicate glass .	4-11	-		-	-	-	-	-	-	-	1725	-	-	-	-	-
Solex 2808 plate glass	4-II	1779	-	-	-	-	-	1791	1783	1793	1797	-	-	-	-	-
Solex "S" plate glass	4-11	1779	-	-	-	-	-	1791	1783	1793	1797	-	-	-	-	-
Spektralkočie artificial graphite.	1	-	-	-	-	-	-	-	360	-	-	-	-	-	-	-
Spinal, magnesium aluminate	4-11	1007	1007	-	-	-	1009	1011	1013	1015	1017	-	-	-	-	-
Spinal, magnesium aluminate, with sodium (mon-) oxide	4-11	_	_	_	-	-	_	1524	1526	1528	1530	-	_	_	_	_
Spinal, magnesium chromite	4-11	~	-	-	-	-	-	-	-	-	1059	_	_	_	_	_
Spinal, nickel ferrite	4-11	-	_	-	_	_	-	1089	_	_	-	-	_	_	_	_
Spinal, zinc chromate	4-11	-	_	-	_	_	-	_	_	_	1063		_	_	_	۱.
Spodumene	4-11	-	-	-	-	-	_	_	1266	-	1270	-	_ i	_	-	_
Sponge zirconium	1	-	_	_	_	-	1102	_	1106	_	_	_	_	_	_	_
	2-I	_	-	_	_	_	699	_	-	_	_	_	_	_	_	_
Stafoam 604	6-II	-	-	-	-	_	-	_	964	- !	-	-	-		-	_
Stainless steel coated with NBS coating A-418	6-1]	-	-	-	-	-	-	-	-	-	-	-	1365- 1367	-	-	-
Stainless steel coated with NBS coating N-143	6-11	-	-	-	-	-	-	-	-	-	-	-	1357- 1359	-	-	-
Stainless steel coated with platinum	6-II	_	_		_	_	_	_	_	_	_	_	131.	_	_	_
Steatite	4-11	1285	_		_	_	1287		1293	_	1295	_	-	_	_ '	_
Steatite, ultra-	4-11	_	_	_	_	_	1287	_	-	_ :	-	_	- 1	_	_	¦
Steatite 10B-2	4-11	-	-	_	_		-	-	1293	_	_	-	-	_	_	_
Steatite 12C-2	4-11	-	-	-	- 1	-	-	-	1293	-	-	-	-	-	-	_
Steatite, grade L-4, AlSiMag 196	4-11	-	-	-	-	_	1287	-	-	-	-	-	- 1	_	_	-
Steatite, grade L-5, Pass and Seymour E-211-M	4-II	-	-	-	-	-	1287	-	-	-	-	-	-	-	-	-
Steels (special designations)						İ										
	3	-	-	-	-	-	-	161	-	-	215	-	-	-	- ,	-
	3	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-
4 10h13	3	-	-	-	-	-	-	73	-	-	-	-	-	"	-	-
12 NoV	3	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-
1.5 KhM	3	•	-	-	-	-	-	-	-	-	100	-	-	-	-	-
17-4 PH	3	145	-	-	i - '	-	-	157	170	-	199	-	-	-	-	-
17 - 5 MnV	3	140	-	-	-	-	-	159	172	-	116 199, 203	231	- 255, 259,	- 382	-	-
17-10 P	3	-	-	-	-	-	-	-	-	-	227	-	270 -	-	_	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	iteat of Vaporization	Heat of Lublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffuelvity	Thermal Linear Expansion	Therma! Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	To the state of th
Steels (coxt.)																
18-8	3	-	-	-	-	-	-	-	-	-	- 1	-	236, 241	-	-	-
18-8 Cr-Cu	3	-	-	-	-	-	-	-	-	-	-	-	-	138	-	-
18-20 Cr-Mn	3	-	-	-	-	~	-	-	-	-	-	-	-	348	-	-
18-21 Cr-Ce	3	-	-	-	-	-	-	-	-	-	-	-	-	302	-	١.
19-9 DL	3	-	-	-	-	-	-	-	-	189	211	-	-	-	-	١.
19-9 DX	,	-	-	- 1	-	-	~	-	-	-	225	-	-	-	- '	•
2s D 245	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	١.
815	3	310	-	-	-	-	-	-	-	-	340	-	-	-	-	١ :
A-286	3	379	-	-		-	-	~	391	397	401	-	409- 411	413	-	'
AISI steels (see AISI designations)				[[
Allegheny 18-8 M	3	-	-	-	-	-	149	-	-	-	-	-	-	-	-	١.
Allegheoy steels		-	-	-	-	-	-	-	-	-	~	-	257	-	-	1
AM350	3	-	-	-	-	-	-	-	170	-	199	231	236, 259, 268	280	-	
AM355	3	-	_	-	-	-	_	157	170	-	199	_	_	_	_	١.
AMS 2713	3	-	_	-	_	-	-	-	385	-	-	_	_	_	_	١.
AMS 2714	3	-	- ,	ļ -	-	-	-	-	387	-	-	-	-	_		١.
ATS	3	140	-	-	-		-	-	-	-	221	-	_	-	-	}
B-759	3	-	-	-	-	-	-		~	-	106	-	<u>-</u>	-	-	
Carbon steel ASTM A105 grade II	3	-	-	-	-	-	-	-	-	-	337	-	_	-	-	
Cor-ten	3	-	-	-	-	-	-	-	-	85	-	-	-	-	-	١.
DVL 4/V 869	3	-	-	-	-	-	-	-	-		403	-	-	-	- 1	
DVL 30	3	140	-		-	-	-	-	-	-	225	-	-	-	-	١.
DVL 31]3	-	-	-	-	-	-	-	-	-	40 3	-	-	-	-	
DVL 46	3	140	-	-	-	-	-	-	-	-	217	-	-	-	-	
DVL 47	3	140	-	-	-	-	-	-	-	-	217	-	-	-	-	
DVL 48	3	-	-	-	-	-	-	-	-	-	217	-	-	-	-	
	3	140	-	! -	-	-	-	-	-	-	217	-	-		-	
	13	140	-	-	-	-	-	-	~	~	217	-	-	-	-	
	3	240	-	-	-	-	*	-	-	-	227	-	-	-	-	
	[3	140	-	-	-	-	-	-	-	-	225	-	-	-	-	'
E1,-257	3	-	-	-	-	-	-	155	-	-	-	-	-	-	-	
F.I572	3	-	-	-	-	-	-	^	178	-	215	-	-	-	-	١
EI-606	3	-	-	-	-	-	-	-	172	-	215	-	-	-	-	'
	3	-	_	-	-	-	-	-	-	-	215	-	-	-	-	
E1-802,	3		_	-	_			-	-	~	104	-	-	-	-	
EI-855	3		_]		_	-	383	394	397	-	i	- 1	-	-	1
EME	3	ı - I	_		1 -	"		-	- :	- :	225	-	I -	i -	1 -	1

Steels (cost.)	Steals Court.	1			Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal	Thermal Emittance	Thermal Reflectance
Ea 19 3 61 83	En 19 3 61 - 83				T									-		1		-
En 31	En 31		En 8	• • • • •	. 3	-	-	-	-	_	312	-	325	_	١.	۱.	١.	_
En 31 3 311 61 83 341 7	En 31		Ea 19		. 3	-	-	-	-	-		Ì -	l	l _	_	۱.	1	1
FORM 3 3 311 341 348	FORM 38 3 311 341		En 31		. 3	-	; -	-	-	-	1	-	1	۱.	i _	l _	1	1
Feat 38 3 369 369 GX 4881 3 389 389 389	Feel 38 3 368 368 368 368		FCM		. 3	311	-	-	-	_	· .	١.	1	1	l	l	1	l
G 17 GX 4881 Haynes alloy no. 90. 3	G 17 GX 4881 Haynes alloy no. 90. 3		Foni 36		. 3	-	-		-	_	_	١.	-	l	1	{	1	1
Haymes alloy no. 90. 3	Haynes alloy no. 90. 3		G 17		. 3	-		-		_	_	_	1	i		ĺ	1	l
Haynes alkey no. 90. 3 1066 1066 1066 1066 1066 1066 1066 1066 1066 1066 1066	Haynes alkey no. 90. 3 106 106 Hayness alkey no. 93. 3 106 105 105 105 105 105		GX 4881		. 3	-	-	İ -	_	_	_	_				l		1
Hegrade alloy no. 93	Hegrade alloy no. 93		Haynes alloy no.	9 0	. 3	-	-	-	-	_	_	_			1		1	l
HF grade	HF grade				. 3	-	-	-	-	_	_	_			ĺ	l	-	İ
A. L. T. 3 (British design.). 3 55 61 - 81 - 102 High speed steel M1 . 3 351 181 High speed steel M2 . 3 450	in vi. T. 3 (British design.). 3				ı	-	141	_	_	_	_	j	Ì		1		-	1
High speed steel M1	High speed steel M1		ia. vi. T. 3 (Britis			5.5	1	_	1							1	-	-
High speed steel M2.	High speed steel M2.					1	1	١.	! !		-					i	-	-
High speed steel M10 . 3	High speed steel M10				ì		i	ł									1	-
High speed steel Ti	High speed steel Ti					_	1	1						-	-	-	-	-
HNM crucible 3 161 176 - 227 HX 4249	HNM crucible 3 161 176 - 227 181 176 176				!_	-	1	-	-	-	-	-	ìi	-	-	-	-	-
Incology See Incology See Incology See Incology See Incology See Incology See Incology See Incology See Incology See Incology See Incology See	HX 4249				1	-	1	j	-	- i	-	-	1	-	-	-	-	-
Israer H	Invar H			• • • • •	1.	! -	-	-	-	-	-	161	176	-	227	-	-	-
Invar H 3	Invar H 3				. 13	-	-	-	-	-	-	-	-	85	-	-	-	-
Jessop no. 40 3 55 102 102 102 102 102 102 102 104 105	Jessop no. 40			оюу)	Į.	1)	ļ		- 1								
Jessop no. 46	Jessop no. 46			• • • • •	. 3	1	-	-	-	-	- j	-	-	-	363	-	-	-
Jessop G-18B	Jessop G-19B		-	• • • • •	. 3	1	-	-	-	-	-	-	-	-	102	-	-	=
Jessop G-21	Jessop G-21		_	• • • • •	. 3	55	-	-	-	- [-	-	-	-	104	-	-	-
Jessop H-40	Jessop H-40		-	• • • • •	. 3	379	-	-	-	-	-	-	168	-	217	-	_	-
Jessop R-20	Jessop R-20			• • • • •	. 3	140	-	-	-	-	-	- ¦	-	-	225	-	-	-
Kovar 3 - <td>Kovar 3 -<td></td><td>Jessop H-40</td><td>• • • • •</td><td>. 3</td><td> - </td><td>- </td><td> - </td><td>-</td><td>- </td><td>- </td><td>- </td><td>81</td><td>- <u>!</u></td><td>- </td><td>-</td><td>-</td><td>-</td></td>	Kovar 3 - <td></td> <td>Jessop H-40</td> <td>• • • • •</td> <td>. 3</td> <td> - </td> <td>- </td> <td> - </td> <td>-</td> <td>- </td> <td>- </td> <td>- </td> <td>81</td> <td>- <u>!</u></td> <td>- </td> <td>-</td> <td>-</td> <td>-</td>		Jessop H-40	• • • • •	. 3	-	-	-	-	-	-	-	81	- <u>!</u>	-	-	-	-
Low carbon	Low carbon		Jessop R-20	• • • • •	. 3	140	-	-	-	- j	-	-	176	-	221	-	-	-
Macky G 3 3 3 333 -	Macky G 3 3 3 333		Kovar	• • • • • ·	. 3	-	-	-	-	-	-	- !	363	- }	-	-	-	-
Mark 12MX 3 -	Mark 12MX 3 -			• • • •	. 3	-	-	' - i	- [-	- [319	-	-	-	_	_	_
Mark 12MX 3 -	Mark 12MX 3 -		Macky G		. 3	- 1		-	-	-	-	-	393	-	.	_	_	_
Mark 1x18N9T 3 - <t< td=""><td>Mark 1x 18N9T 3 - <</td><td></td><td>Mark 12MX</td><td>• • • • •</td><td>3</td><td>-</td><td>-</td><td>- </td><td>-</td><td>- </td><td>. </td><td>323</td><td></td><td>- </td><td>- </td><td>_</td><td>_ </td><td>_</td></t<>	Mark 1x 18N9T 3 - <		Mark 12MX	• • • • •	3	-	-	-	-	-	.	323		-	-	_	_	_
Mild steel	Mild steel		Mark 1x18N9T		3	-	-	-	-	- [-	1	- 1	-	215	_	_	_
Multimet N-155 3 140 189 191 219 120 126 - 128, 253, 259 Multimet N-155, low carbon. 3 296 219 219	Multimet N-155 3 140 189 191 219 120 126 - 128, 253, 259 Multimet N-155, low carbon . 3 296 219		Mild steel		3	311	-	-	-	-	-		-	- }		_	_	_]
Multimet N-155, low carbon. 3 256 253, 259 Multimet NR-21 (AMS-55326) 3 146 219	Multimet N-155, low carbon. 3 296 296 296		Multiract N-155		3	140	-	-	-	-	-	- 1	100	101	210			
Multimet NR-21 (AMS-55326) 3 146 219 Multimet NR-21, low carbon (AMS-53762) 3 219 N-A-X AC 9115 3 444 Ni-Sper-C alloy 902 3	Multimet NR-21 (AMS-55326) 3 146 219 Multimet NR-21, low carbon (AMS-53762) 3 219 N-A-X AC 9115 3 444 Ni-Sper-C alloy 902 3 467																128, 253,	
(AMS-55326) 3 146 219	(AMS-55326) 3 140 219			ow carbon.	3	-	~	-	-	-	-	-	296	-	-	- 1	-	_
Multimet NR-21, low carbon (AMS-53762) 3 219 444	Multimet NR-21, low carbon (AMS-53762) 3 219				,	1,40	_	_ 1					ļ		- 1	l	Į	- 1
(AMS-53762) 3 219 N-A-X AC 9115 3 444 Ni-Sper-C alloy 902 3	(AMS-53762) 3 219 N-A-X AC 9115 3 444 Ni-Sper-C alloy 902 3			 		140	-	i	- }	-	- 1	-	- }	-	219	-	.	-
N-A-X AC 9115 3 444	N-A-X AC 9115 3				3	-	_]	- 1	_	_ i	_	_	_	_	210	_		I
Ni-Spar-C alloy 902 3	Ni-Spar-C alloy 902 3		•			_	- 1	_	-	_	_	_ [_ 1		- 1	-	-
Chi ien acuer	Can less seven				1 1	-	_	_	_	_		_		_	1	-	1	-
353 - 397	353 - 357				1.	_	_	_	_	_		303	Į.	200	1	-	- 1	-
					ľ		- 1	- [_	- 1	353	- 1	397	-	-	-	-

Ma teria i Name	Volume	Density	Melting Point	Roat of Fusion	Heat of Vaporization	Heat of Sublimation	Electricai Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffuelvity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittan :e	Vapor Pressure
Sterls (cont.)																
P-193	3	379	-	-	-	-	-	-	-	-	405	-	-	-	-	-
PH 15-7 Mo	3	145	-	-	-	-	-	-	-	-	201	231	255, 259, 272	284	-	-
Porous	3	461	-	-	-	-	463	-	-	-	-	-	-	-		-
Rex 78	3	-	-	- ,	-	-	-	-	389	-	-	-	-	-	-	-
Roneusil	3	-	-	- '	-	-	-	-	-	-	-	-	-	349	-	-
S-590	3	-	-	-	-	-	-	-	-	191, 208, 397	221	-	-	-	-	-
SAE steels (see SAE designations)	.	Ì														
SA5-8	3	140	-	-	-	-	-	-	-	-	227	-	-	-	-	-
Steel 15	3	-	-	-	-	-	-	-	-	331	-	-	-	-	-	-
Steel 19	3	-	-	-	-	-	-	71	-	-	-	-	-	-	-	-
Steel 35	3	-	-	-	-	-	-	-	-	331	-	-	-	-	-	-
Steel 45	3	-	-	-	-	-	-	-	-	331	-	-	-	-	-	j -
Terr'n	3	-	-	-	-	-	-	-	-	-	116	-	-	-	-	-
U-8	3	-	-	١ -	-	-	-	10	-	12	-	-	-	-	-	-
Unicemp 212	3	-	-	-	-	-	-	-	391	-	-	-	-	-	-	-
V-444D	3	-	-	-	-	-	-	-	-	-	223	-	-	-	-	-
Vacromin F	3	-	-	-	-	-	-	-	393	-	-	-	-	-	-	-
Vascojet 1000	3	-	-	-	-	-	-	-	81	-	-	-	132	136	-	-
Vickers F. D. P	3	-	-	-	-	-	-	-	· ·	-	-	-	257	-	-	-
	3	-	-]	-	-	-	-		_	203	-	-	-	_	· ·
WF100D	3	140	_			-	_	_		-	225 1267	<u>-</u>	-	_		
Steel, clad Stellite no. 3	6-11		-	-	_	_	-	-	_	_	904	-]	
Stellite no. 4	2-II 2-II	_	-	_] -	_	_			-	904	_		_	_	
Stellite no. 6	2-11	_	-	_	-	_	_	_	_	_	902	_		_	-	
Stellite no. 6B	2-II	_	_	-	_	_	-	_	_	_	902	•	_	_	_	-
Stellife no. 6K	2-11	-	-	-	-	-	-	-	-	_	902	_	_	-	_	
	2-11	- 1	-	-	-	_	-	_	_	-	902	_	_	_	-	_
i	2-11	_	_	_	_	-	-	-	-	-	904	-	_	_	-	-
Stelline no. 21 (AMS-5385; NR- 10)	2-11	879	-	-	-	-	-	884	886	-	894	_	-	_	-	_
Stellite no. 23 (AMS-5375; NDRC-61)	2-11	879	_	-	_	-	-	-	886	_	900	_	-	_	_	-
Stellite no. 25 (L-605)	2-11	879, 852	-	-	-	-	-	-	-	890	896	-	908- 914	316	-	-
Stellite no. 25 (L-605) coated with iron (ic) oxide	6-11	-	-	-	-	-	-	-	-	-	-	-	1381- 1383	-	-	-
Stellite no. 27 (AMS-5378; NR-60)	2-11	1219	-	-	-	-	-	-	1223	-	1225	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Stellite no. 30 (AMS-5380, NR-12)	2-11	379	-	-	-	-	-	_	-	-	896	-	-	-	-	-
Stellite no. 31 (AMS-\$382; NR-71)	2-11	879	-	-	-	-	-	-	886	-	896	-	-	-	~	_
•=••	2- I I	879	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-II	-	-	-	-	-	-	-	-	-	906	-	-	-	-	-
	2-II	-	-	-	-	-	-	884	888	-	900	-	-	-	-	-
	2-II	-	-	-	-	-	-	-	-	-	906	-	-	-	-	-
Strontiem (44)	1	924	924	-	-	-	926	-	-	-	928	-	-	-	-	-
SrO·Al _g O,	4-11	1025	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SrO-2 Al ₂ O ₃	4-II	-	1025	-	-	-	-	-	-	-	1027	~	-	-	-	-
3 5r0 · Al ₂ O ₃	4-II	1025	-	•	-	-	-	-	-	-	-	-	-	-	-	-
Strontium abunium silicate (SrO·Al ₂ O ₃ ·2 SiO ₂)	4-II	-	-	-	-	-	-	-	-	-	1334	-	-	-	-	-
Stroutium barium cerium tita- nate [(Ba _{1-X-y} Sr _X Co _y)O·TiO ₂].	4-11	-	-	-	-	-	1466	-	-	-	-	-	-	-	-	-
14-6- 25-65	4-II	-	-	-	-	-	1363	-	-	-	-	-	-	-	-	-
	4-II	-	-	-	-	-	-	-	-	-	1633	-	-	- '	-	-
Strontium (hexa-)boride (SrB ₆).		295	296	-	-	-	-	-	-	-	-	-	_	-	-	-
Strontium chloride (SrCl ₂)	5	-	-	-	-	-	-	333	-	-	-	-	-	-	-	-
	4-11	-	-	-	-	-	-	-	-	-	1336	-	-	-	-	-
	5	397	397	-	-	-	-	399	-	-	-	~	-	401	-	-
Strontium lead silicate glass	•	_	-	-	-	-	1923	-	-	-	~	-	-	-	-	-
Strontium oxide (SrO)		387	387	-	-	387	389	391	393 15:0	-	395	-	-	-	-	597 -
	4- <u>11</u>	-	-	-	_	-	-	-	1542	-	-	-	-	-	-	-
	4- <u>II</u>	-	-	-	-	-	-	-	1544	~	-	-	-	-	-	-
()	4-1	-	828	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium oxide + Titanium (di-) oxide + Lithium zirconium silicate	4-II	-	-	-	-	-	-	-	1546	-	-	-	-	-	-	-
+ Litkium zirconium silicate .	4-A	-	-	-	-	-	-	-	1548	-	-	-	-	-	-	-
Strontium silicates SrO-SiO ₂	4.11	1333	1332	_	_	_	_	_	_	_	_	_	_	l _	_	
•	1		1332	_	-	-	-	-	<u>-</u>	<u>-</u>	-	<u> </u>	_	-	_	
2 SrO · 84O ₂	-11		-	_	-	_	_	-	-	_		-	_	-	_	

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Material Name	Volumo	Density	Melting Point	Heat of Fusion	Heat of Vacorization	Heat of Sublimation	Electricul Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittence	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
• •	5	-	-	-	-	-	-	712	-	-	-	-	-	-	-	-
Strontium titanates																
SrO·TiO ₂	4-11	1456	1456	-	-	-	1456	146G	1462	-	1464	-	-	-	,	-
SrO-2 TiO ₂	4-II 4-II	_			-	_	_	1460	_	_	1464	-	-	-	_	-
Strontium titanate conting on AISI 310	6-11	-	_	-	-	_	-	-	-	-	_	-	1393	-	_	•
Strontium titanate + Cobalt cermet	6-11	-	_	-	-	-	-	-	792	-	-	-	_	_	-	-
Strontium uranate (SrO-UO ₂)	4-11	-	1482	-	-	-	-	<u>,</u> -	-	-	-	-	-	-	-	-
Strontium zirconate (SrO-ZrO2).	4-11	1514	-	-	-	-	-	1516	-	-	1518	-	-	-	-	-
Styrene-butadiene copolymer	6-II	-	-	-	-	-	-	1054	-	-	-	-	-	-	-	-
Styrofoam Q-103	6-II	-	-	-	-	-	-	-	1090	-	-	-	-	-	-	-
Super Dylon	6-II	1030	-		-	-	-	-	-	-	-	-	-	-	-	-
Supramica 557	5	-	-	-	-	-	967	-	-	-	-	-	-	-	-	-
Svea Iroa	1	-	-	-	~	-	-	-	585	-	-	-	-	-	-	•
T																
TAC polyester	6-11	974	-	-	-	-	-	-	976	-	378	-	-	-	-	-
TAC polyester resiz, reinforced	6-II	1180	-	-	-	-	-	1182	1185	12.20	1187- 1185	-	-	-	-	-
Taic	4-II	-	-	-	-	-	-	1289	- 1	-	-	-	-	-	-	_
Tan 9-4 tantalum	1	-	-	-	-	-	-	934	-	-	-	-	-	-	-	-
Tentalum (Ta)	1	930	930	-	-	930	93 2	934	936	236	940	942	944- 950	962	-	964
Tantalum coated with aluminide.	6-11	-	-	-	-	-	-	^	-	-	-	-	1441- 1443	1445	-	-
Tantalum coated with cobalt oxide	6-II	-	-	-	-	-	-	-	-	-	-	-	1373- 1375	-	-	-
Tantalum coated with pyrolytic graphite	6-II	-	-	-	-	-	-	-	-	-	-	-	1297-	-	-	-
Tantalum coated with silicide	6-11	-	-	-	-	-	-	-	-	-	-	-	1299 1473- 1475	1477	-	-
Tantalum costed with silicon carbide	6-II	-	-	-	-	-	-	-	-	-	-	-	1411- 1413	-	-	-
Tantalum coated with tantalum aluminide	6-JI	-	-	-	-	-	-	-	-	-	-	-	3461- 1463	1465	-	-
Tantalum + Copper + ΣX_i	2- <u>II</u>	1388	-	-	-	-	-	-	1390	-	1392	-	-	-	-	-
Tantalum + Niobium	2-I	-	-	-	-	-	463	-	465	-	-	-	-	-	-	-
Tantalum + Niobium + ΣX_i	2-U	-	-	-	-	-	-	1394	1396	1390	1400	-	-	-	-	-
Tantalum + Titanium	2-1	467, 548	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tantalum + Tungsten	2-1	-	-	-	-	-	-	469	471	473	475	477- 479	-	-	-	-

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of	Heat of	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal	Thermal Linear Expension	Thermal Absorptence	Thermal Emittance	Thermal Reflectance	Thur, mai	Vapor Pressure
Tantalum + Tungsten + EX; Tantalum + Zirconium + EX; Tantalum alloys (special designation)	2-II 2-II	- 1414	1475	-	-	-	1406	1406 1416	1496 1418	1410	1412 1420	-	-	-	-	-
30 26 - 7.5 V 8 W - 2 Hf	2-II 2-II	-	- 1602	-	-	-	-	1394	-	1396	-	-	_	-	-	-
Tantalum aluminide (TaAl ₂) Tantalum aluminides conting on instalum	6-II	-	-	-	-	-	1404	1406	- -	1410	-	-	-	- 25	-	-
Tantalum antimonide (Tafb) Tantalum arsenide (Ta ₂ As ₂)	6-1	-	-	-	-	- -	71	-	- 73	-	-		1461- 1463	1465	-	-
Tastalum beryllides TaBen	6-I	-	122	-	-	-	96	-	-	_	-	-	-	-	-	-
TagBe _{II}	6-1	-	122	-	-	-	-	124	126	-	125	-	130- 132 130-	134	-	- _
	5	-		-	-	-	-	-	-	-	-	-	132	872	-	_
	5	-	-	-	-	-	-	-	-	-	-		874- 876	578	_ [_
	5	-	-	-	-	-	-	-	-	-	-	-	580- 652	854	-	_
Tantalum borides TaB		- 1	- 1	- 1	- 1	ı			- 1						i	
5.	- 1	212	212	-	-	-	-	214	216	-	218	-	-	_	_	_
Ta _B ₂	- [212	212	-	-	-	-	214	-	-	220	-	-	-	_ !	_
Ta _p B ₄	6-1	-	212	-	-	- !	-	- [- i	-	-	-	-	-	-	_
Tantalum carbides			212	_	-	-		-	-	-	-	-	-	-	-	-
	5		141	-	-	-	143	145	167	149	151		154- 158	-	-	160
	6-II	- 858	-	-	-	-	-	-	-	-	-	- 14	117 1	119	-	_
Pantalum carbide + Tungsten cermet	6-II	-	-	-	-	-	-	_	-	-	969	-	-	-	-	-
antalum-chromium intermetal-	Ì	- [684	-	-	-	-	-	-	-	- .	- .	-	-	-	-
fantalum ferrides (TaFe ₂) (i-1	- 1	584 306	-	-	-	-	-	-	-	- -	- -	-	-	-	-
antalum germanides TaGe									İ			- .		-	-	-
1400	i-I		-	-	-	-	325	-	-	-	- ·	- -	- -	- .	-	-

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Material Nome	Volume	Denaity	Melting Point	Heat of Pusion	Heat of Vaporization	Heat of Biblimation	Electrical Resistivity	Specific Nest	Thermal Conductivity	Thermal Diffuelyity	Thermal Linear Expansion	Thermal Absorptince	Thermal Emittance	Thermal Reflectance	Thormal Transmistator	Vapor Pressure
Tantalum germandes (cont.)																
TaGe ₂	6-1	-	-	-	-	-	325	-	327	-	-	-	-	-	-	-
TagGe	6-3	-	- 1	-	-	-	-	-	-	-	-	-	-	-	-	321
Tantalum germanide albicides																
TaGeSi ₂	5-1	-	-	-	-	-	-	-	525	-	- 1	-	-	-	-	
Tare _x Si _{1-X}	6-1	-	-	-	-	-	-	-	239	-	-	-	-	-	-	-
Tantalem iron lend onide (4 PhO-To ₂ O ₂ -To ₂ O ₃)	4-Ei	-	_	_	_	_	_	_	_	_	1157	_	_	-	_	_
Tautalum attrides											****					
	5	557	53/	-	-	-	550	561	563	-	565	-	567-	_	-	-
													520			
•	s	<u>-</u>	557	-	-	-	-	-	ļ - ļ	-	-	-	-	-	-	-
Tantalum (pent-)oxide (Ta ₂ O ₂) .	8-3	-	-	-	-	-	-	330	-	-	₩I	-	463- 465	407	-	-
Tantalum (pest-) suide + + Tantalum besynide	5	-	-	-	_	-	-	-	-	-	-	-	-	790	-	-
Tantakın phosphide (TaP)	5	635	C36	_	-	-	S	-	-	-	-	-	-	-	-	-
Tantthun scienides (TaSe ₂)	6-3	-	-	-	-	-	357	-	363	-	-	-	-	-	-	-
Tastalium silicides																
TagSig	6-2	-	467	-	-	-	-	-	-	-	-	-	-	-	-	
TaSi ₂	6-2	-	467	-	-	-	527	469	529	-	471	-	m-	477	-	-
Ta ₂ Si	6-1	_	467	_	_	_		_					475		_	
Ta _p Si ₂	6-1		457	_								-		_		_
Ta _L Si	G-I	_	467	_	_	_	_	_			_	_	_	_	_	_
(Penta-) tantalum (tri-) silicide +	6-1	_	734	_	_	_	_	-	_	_	-	-	-	_	_	_
Tastaban afficide germandes																
TaGe _{1-R} Si _Z	6-1	-	-		_	-	3025	-	-	-	_	-	-	-	-	-
TaGeSi		-	-	-	-	-	323	-	-	-	-	-	-	-	-	-
Tantaken telle; idea																
TsTe	6-3	-	-	-	-	-	- ;	-	640	-	-	-	-	-	-	-
TaTe ₂	6-1	-	-	-	-	-	(3)	-	600	-	-	-	-	-	i - i	-
1	6-J	-	-	-	-	-	C39	-	-	-	j -	-	-	-	- 1	i -
Tantalum tangaten selenide (W _{1-X} Ta _X So ₂)	١.,			_	_	_	357	_	i _	_	_	<u> </u>		! 	_	_
Telion		3070		_	_	_	J.,	1435	1239	_	3045		-	_	<u>-</u>	
Telion, type TF-1	5 1			_	_	_	_	-	_	_	3045				_	
Tellon, Lorium titamate filled.			-	-	-	- 1	_	_	-	_	PO	-	_	-	_	_
Tellon, boron carbide filled	t :		_	-	_	-	-	_	-	_	3943	-	-	-	_	_
Teilon, calcium boride fillof	•		-	-	-	-	-	-	- 1	-	340	-	-		_	-
Talka, carbonyi ison grade HP	i.															
	k-2		-	-	-	-		-	-	-	7943	-	-	-	_	-
Teller, J-lettille filled	₹ "!	1 :						_		-	3403		-	-	! -	_
Telios, J-mics filled	1-4	1412	¦	Ī -]		-	-	-	-	2963	-	-	-	-	-
										1						
		لــــا	لــــا	L	<u> </u>			لــــــا		L		L	<u></u>	<u> </u>	L	

Material Name	Volume	Denaity	Melting Point	Heat of Fusion	Heat of Vapos Ization	Heat of Sublimation	Electrical Resistivity	Specific Heat	`nevmal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Teflon laminate	6 -1 1	-	_	-	_		-	1214	1218	1220	-	-	_	_	-	_
Teflon, litharge filled	6-11	1032	-	- 1	_	_	-	-	-	-	1043	_	_	_	-	_
Teflon, powdered iron-9 filled .	6-11	1032	- 1	~]	-	_	-	_	-	-	1043	_	-	_	_	۱ ـ
Tefion, quartz no. 7900 filled .	6-II	1032	- 1	-	-	_	-	_	_	_	1943	_	-		_	-
Teflon, reinforced	6-11	1097	_ }	-	_	_	_		1099	_	~	-	~	_	_	-
Teflon, titanium dioxide filled .	6~11	1032	_]	_	_	_	-	_	-	-	1043	_	_	\ ~	_	-
Teflon, zero-plast type 6 filled .	6-11	1032	.]	_	_	_	_	_	_	_	1043	-	_	_	_	_
Television tube glass	4-11	-	_ [_	_	_	_	_	i _ l	_	_	_	1743	1745	1747	_
Tellurite	4-1	409	409	_	_	409	_	411	_	_	_		413		415	417
Tellurium (Te)	1	-	_	_	_			-	964	_	_		-	_	410	-
	2-1	_	_	_		-	451	483	-	_	-	_	_	_	_	_
Tellurium copper	2-1		_	_	_	_		103	_	_	152			_	_	
Brass, tellurium-nickel	2-11	_	_	_	_	_	_	_	_	_	1002	_ '	_	_		_
Tellurium (di-)oxide (TeO ₂)	4-I	409	409	_	-	409	_	211		_	1002	_	413	_	415	417
Tellurium oxide - molybdenum oxide glass	4-11	-	-	_	_	-	_			_	1641	_	413	_	413	_
Tellurium oxide -turgaten oxide	4-11	-	_	-	_	_	_	_	_	_	1643	_	_	_	_	_
Tenite I 0072-MS	6-21	. [_	_	_		_	_	_]_	941	_	_	_	_	_
Tenite I 204-MS	6-II	_	_	_	_	_	_	_	1_	_	946	_	_	_	_	_
Tenite II 205A-MS	6-11	_	-	_	_	_	_	_	_	_	946	_	_		1 1 -	_
Teaite G 204-H2	6-11	_	_	_	_	_	_	_	_	_	946	_	_		_	_
Tenite Q 264-H2	G-II	_	_	_	_	_	_		_	_	246	_	_	<u> </u>	_	_
Tenite S 264-MS	6-11	_	_	_	_	_	_	_	_	_	946	_	_	<u> </u>		_
Terbium (Tb)	1	956	956	956	956	956	958	960		_	962	_		_	_	
Terbium borides		330	330	300	320	330	333	300	-	} _]		-	
TbB ₄	6-II	298	_	_	_	_	_	_	_	_	_		l _	_	_	_
Ti-Eg	6-1	295	-	_	_	_	300	¦ _	_	_	_	_	_	_	_	_
Terbium carbides	•							1	}	}	1	}	j			1
TbC ₂	5	294	_	_		}_	_		_	١	_	_	_	١_	i _	_
Tb ₂ C ₃	5	294	_	_	_	_	_	_	_		_	_	_	_	_	_
Terbium-cobalt intermetallics	6-1	681	-	-	-	_	_	_	_	_	_	_	_	_	-	_
Torbium-gallium intermetallics (TbGa ₂)	5-1	681	-	-	-	_	~	_	} ı -	_	_	_	_	_	-	-
Terbium hydride (TbHs)	5	467	-	-	-	-	-	-	! -	-	-	-	i -	-	-	-
Terbium oxide (TbO _{1, \$14})	4-1	-	-	-	-	-	-	-	-	-	-	i -	-	-	Ì ~	42
Thorianite	4-1	421	421	-	-	422	425	42à	430	-	43%	-	435	_	_	43
Thorite	ł	_	-	-	_	-	-	_	-	~	1338	_	_	-	_	-
Thorium (Th)	1	966	966	967	_	-	971	973	975	977	979	_	981	-	-	98:
Thorium + Plutonium	•	411, 485	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thorlun: + Titanium	2-1	-	-		-	-	-	-	-	-	487	! -	-	_	-	-
Thorium + Uranium	2-1	-	-	-		-	489	-	-	-	-	-	_	-	-	_
	5 °	1	•	ī	ı	I	ſ	ı	F			1	1	I	1	1

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity		Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Thorium + Uranium + ΣX_i	2-11	-	1422	-	-	-	-		-	-	-	_	-	-	-	-
Thorium + Zirconium	2-I	•	-	-	-	-	-	-	-	-	491	-	-	-	-	-
Thorium + Zirconium + ΣX_i	2-11	-	1424	-	-	-		-	-	-	-	-	-	-	-	-
Thorium aluminate (2 ThO ₂ · 3 Al ₂ O ₃)	4-11	-	-	-	-	-	-	-	-	-	1029	-	-	-	-	-
Thorium antimonides																
ThSb	6-1	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ThSb ₂	6-1	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Th ₃ Sb ₄	6-1	81	-	-	-	-	-	-] -	-	-	-	-	-	-	.
Thorium borides		<u> </u>									1	}				
ThB ₄	6-1	. 2	222	-	-	-	224	226	228	-	230		232	-	-	-
ThB ₆	6-1	-	222	-	-	-	224	-	-	-	-	-	-	-	-	- !
Thorium carbides		'														
ThC	5	-	162	-	-	-	-	-	168	-	-	-	172	-	-	-
ThC ₂	5	162	162	-	-	-	164	166	168	-	170	-	172	-	-	-
Thorium carbide + Uranium (di-) carbide	5	-	-	-	-	-	-	-	-	-	301	_	-	-	-	_
Thorium chloride (ThCl.)	5	339	- 1	-	-	~	-	-	-	-	_	-	-	_	-	- 1
Thorium fluoride (ThF4)	5	403	403	403	403	403	-	-	- 1	_	-	-	_	_	-	405
Thorium hydrides	i															1
ThH:	5	439	-	-	-	_	-	-	- 1	-	-	-	_	_	-	_
ТЬН3	5	-	-	-	-	-	-	-	-	-	_	-	-	-	-	441
Thorium-manganese intermetal- lics																
ThMn ₂	6-1	683	-	-	-	-		-	-	-	_	-	-	-	_	-
TheMin23	6-I	683	-	-	-	-	-	- 1	-	-	-	_	-	_	-	_ '
Thorium nitrides																1
ThN	5	-	631	-	-	-	-	-	-	-	-	-	-	-	-	-
Th ₃ N ₄	5	-	621	-	-	-	-	-	-	-	-	-	-	-	_	-
Thorium (di-)oxide (ThO2)	4-3	421	421	-	-	422	425	428	430	-	432	-	435	~	-	437
Thorium (di-)oxide, molybdenum fibers reinforced	6-11	_	-	-	-	_	_	_	1265	_	-	-	-	_	_	_
Thorium (di-) oxide + Aluminum oxide	4- <u>I</u>	-	830	-	-	-	-	_	_	-	-	-	-	-	-	_
Thorium (di-)-xide + Aluminum oxide + Beryllium oxide	4-1	_	832	_	_	-	_	_	_	_	-	_	_	-	~	_
Thorium (di-)oxide + Graphite .	5	-	-	-	-	-	-	_	739	-	-	_	_	_	-	_
Thorium (di-)oxide + lungsten cermet	6-II	_	_	_	_	_	_	_		_	_		-	_	-	794
Thorium (di-)oxide - Uranium (di-)oxide	4-1	_	-	_	_	_	834	_	-	-	-	-	_	_	_	
Thorium (di-)oxid~ + Uranium (di-)oxide + Yttı ium oxide	4-I	-	-	_	_	-		_	_	_	_	-	_	_	_	636
Thorium (di-) oxide + Zirccnium (di-) oxide	4- <u>i</u>	-	-	_	_	-	_	_	_	_	838	-	-	_	_	_
,,											300			-	-	

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conduct:vity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Thorium (ortho-)silicate (ThO ₂ ·SiO ₂)	4-11	-	-	-	-	-	-	-	-	-	1338	-	-	-	-	-
Thorium silicides	1															
Th8i	6-I	-	524	-	-	-	-	-	-	-	-	•	-	-	-	-
ThSi ₂	6-I	-	523- 524	-	-	-	-	-	-	-	-	-	-	~	-	-
Thorium sulfides																
ТъS	5	714	714	-	-	-	-	-	-	-	718	-	-	-	-	-
ThS ₂	5	714	714	-	-	-	-	716	-	-	-	-	-	-	-	-
Th ₂ S ₂	5	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
Th _i S _?	5	714	734	-	-	-	-	-	-	-	-	-	-	-	-	-
Th ₁ S ₂₂	5	-	714	-	-	-	-	-	-	-	-	-	-	-	-	į -
	6-I	-	-	-	-	-	-	-	-	-	136	-	-	-	~	-
The vium uranium boride [(Th ₂ II)B ₄]	F-1	-	-	-	_	-	-	-	-	-	234	-	-	-	-	-
Thorium uranium carbides	li									[
(Th _g U)C	5	-	-	-	-	-	-	-	-	-	174	-	-	-	-	١.
(Th ₂ U)C ₂	5	-	-	-	-	-	-	-	-	-	174	-	-	-	-	١ .
Thulia	4-1	-	-	-	-	- 1	-	-	-	-	439	-	-	-	-	-
Thulium (Tm)	1	985	985	985	985	985	987	989	-	-	-	-	-	-	-	95
Thulium (hexa-)boride (TmB ₆).	6-I	295	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thulium carbide (TmC ₂)	5	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thulium oxide (Tm ₂ O ₂)	4-I	-	-	-] _	-	493	_	[[439	-	-	_		
Tin + Magnesium	2-I	_	-	-		-	193	_	_	_	1031	_	[]	_	
Tin(ic) aluminate (2SnO ₂ ·3Al ₂ O ₂)	1	_	_	_	-	_	-	_	441	_	443	-	-	[
Tin(ic) oxide (SnO ₂) Tin(ic) oxide + Magnesium oxide	4-I 4-I			_	-	_		_	840	_	213					Ι.
Tin(ic) oxide + Magnesium Tin(ic) oxide + Magnesium	***				! !				040	}						
oxide + Zinc oxide	4-I	-	-	-	-	-	-	-	842	-	-	-	-	-	-	
(pent-)oxide	4-1	-	-	-	-	-	-	-	-	-	844	-	-	-	-	١.
Tin(ic) oxide + Zinc oxide	4-I	-	-	-	-	-	-	-	846	-	-	-	-	-	-	
Tin(ic) oxide + Zinc oxide + + Magnesium oxide	4-1	-	-	-	-	-	-	-	848	-	-	-	-	-	_	
Tin(ous) (ortho-)phosphate (3 SnO · P ₂ O ₂)	4-11	-	-	-	-	-	-	-	-	-	1179	-	-	-	-	
Tin sulfide (SnS)	5	-	-	-	-	-	-	-	-	-	-	-	-	720	-	
Tin telluride (SaTe)	6 - I	-	-	-	-] -	632	-	-	-	-	-	-	-	-	1
Tin telluride + Silver antimory telluride	6-1	-	-	-	-	-	-	-	721	-	-	-	-	-	-	
Tin-zirconium intermetallics					}	1		1		1	Ì	1	1	1	1	
SaZr ₂	5-1	-	684	-	-	-	-	-	-	-	-	-	-	•	-	
Sa ₂ Zr ₅	6-I	l –	684	l -	1 -	I -	-	I -	I -	l -	l -	1 -	-	1 -		1 .

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Hout of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	The rna! Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Titanium (Ti)	1	993	993	-	-	993	996	999	1001	1003	1005	-	1007- 1013	1015	1	1017
Titanium coated with aluminide.	6-11	~	-	-	-	~	-	-	-	-	-	-	1447- 1449	1451	-	-
Titanium coated with aluminized- silicone paint	6 -1 1	-	-	-	-	-	~	-	-	-	-	-	-	1497	-	-
l'itanium coated with gold	6-II	-	-	-	-	-	-	-	-	-	-	-	1303	1305	-	-
Titanium coated with silicides .	6-11	-	-	-	-	-	-	-	-	-	-	-	1479- 1481	1483	-	-
Titanium A-55	1	-	-	-	-	-	996	-	-	-	1005	~	-	-	-	-
Titanium A-79	1	-	- 1	_	-	-	-	- 1	-	-	1005	-	-	-	-	-
Titanium Ti-75A	1	-	~	-	-	-	996	999	1001	-	1005	-	1007- 1009	1015	-	-
Titanium Ti-75A (AMS 4901) costed with Dow-Corning																
XP-310	6-11	-	-	-	-	-	-	-	-	-	-	-	-	1487	-	-
Titanium RC-55	1	-	-	-	-	-	996	-	-	-	-	-	- 1	-	-	-
Titanium VT-1	1	-	-	-	-	-	-	-	-	1003	-	-	-	-	-	-
Titanium + ΣX_i	2-Ⅱ	1502	-	-	-	-	1504	1506	-	-	1508	- 1	-	-	_	-
Titanium + Aluminum	2- <u>I</u>	-	-	-	-	-	495- 501	-	503	505	-	-	-	-	-	-
Titanium + Aluminum + ΣX_i	2- II	-	-	-	-	-	1425~ 1432	1434	1436- 1442	1444- 1446	1448- 1454	-	1456- 1459	1461	-	-
Titanium + Chromium	2-1	-	-	-	-	-	-	-	-	-	507	-	-	-	-	-
Titanium + Chromium + ΣX_i .	2-13	-	-	-	-	-	-	1464	1466	-	1468	-	-	-	~	-
Titanium + Copper	2-1	-	-	-	-	-	509	-	-	- 1	511	-	-	-	-	-
Titanium + Germanium	2-1	-	-	-	-	-	513	-	-	-	515	-	-	-	-	-
Titanium + Irca	2-1	-	-	-	-	-	-	-	-	-	517	-	-	- 1	-	-
Titanium + Iron + ΣX_i	2-11	1470	-	-	-	-	1472	-	1474	-	1476	-	-	-	-	-
Titanium + Manganess	2-1	519		-	-	-	521	523	525	527	529	-	531- 535	537	-	-
Titenium + Manganese + ΣX_i	2-11	-	-	-		-	1478	-	-	-	1480	-	-	-	-	-
Titanium + Molybdenum	2-I	-	_	-	-	-	- 1	-	-	-	539	-	-	-	~	-
Titanium + Molybdenum + ΣX_1 .	2-11	-	-	-	-	-	1482	-	-	-	-	-	-	-	-	-
Titanium + Nickel	2-1	-	-	-	-	-	-	-	-	-	541	-	-	-	-] -
Titanium + Niobium	2-J	-	-	-	-	-	543	-	-	-	545	-	-	-] -	-
Titanium + Silicon	1	1	-	-	-	-	-	-	-	-	547	-	-	-] -	-
Titanium + Tantalum	2-1	549	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium + Tin	1	1 :	-	-	-	-	551	-	553	-	-	-	-	-	-	-
Titanium + Tin + $\sum X_i$	2~II	-	-	-	-	-	1484	-	1486	-	-	-	-	-	-	- 1
Titanium + Tungsten	2-1	555	-	-	-	-	-	-	-	-	-	-	-	-	-	- :
Titanium + Vanadium	2-1	557	-	-	-	-	-	-	-	-	559	-	-	-	-	
Titanium + Vanadium + ΣX_i		1483	-	-	-	~	-	1490	1492	-	1494	-] -	1496	-	-
Titanium + Zirconium	2-I	~	-	-	-	-	561	-	-	-	563	-	-	-	-	-
Titanium + Zirconium + ΣX_i	2-11	-	-	-	-	-	1498	-	1500	-	-	-	-	-	-	-

Material Name	Volume	Denaity	Melting Point	Host of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thernial Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Titanium alloys (special designations)																
2.5 Al - 16 V	2-11	-	-	-	-	-	-	1490	-	-	-	-	-	-	-	-
	2-11	-	-	-	-	-	-	-	-	-	1454	-	-	-	-	-
4 A1 – 3 Mo	2-11	-	-	-	-	-	-	-	-	-	1452	-	-	-	-	-
4 Al - 3 Mo - 1 V	2-II	-	-	-	-	-	-	1434	-	-	-	-	-	-	-	-
4 Al - 4 Mn	2-11	-	-	-	-	-	-	-	-	-	1450, 1481	-	-	-	-	-
6 A1 - 4 V	2-11	-	-	-	-	-	1428	1434	1410	1444	1454	-	1456~ 1459	-	-	-
7 Al - 4 Mo	2-11		-	-	-	-	-	-	-	-	1452	-	-	-	-	-
7 Al -2 No -1 Ta	2-11	-	-	-	-	-	-	-	-	-	1448	~	-	-	-	-
13 V - 11 Cr - 3 Al	2-II	-	-	-	-	-	-	1490	-	-	-	-	-	-	-	-
48-OT-3	2-1	-	-	-	-	-	-	-	-	505	-	-	-	-	-	-
A-110 AT	2-11	-	-	-	-	-	1432	-	1438	-	1448	-	1456- 1459	1461	~	-
B120VCA (crucible heat no. R6759 sheet no. 9MB3)	2- <u>1</u> 1	-	-	-	-	-	-	-	1492	-	1494	-	-	1496	-	-
BT-5	2-I	-	-	-	-	-	-	-	-	505	-	-	-	-	-	-
C-110M	2-1	-	-	-	-	-	521	523	525	527	529	-	533- 535	537	-	-
C~120AV	2-11	-	-	-	-	-	-	-	-	-	1454	-	-	-	-	-
C-130AM	2-11	-	-	-	-	-	1426, 1478	-	1442	-	-	-	-	-	-	-
Cr-Mo	2-11	-	-	-	-	-	-	-	1466	-	-	-	-	-	-	-
Heat no. 32167 and sheet no. 1777A-1	2-11	_	_	_	_	_	_	_		_	1454	_				_
Heat no. R6736 sheet no. B-32	2-11	-	_	_	_	_	_	,	1436	_	1452	-	-	-	-	
Heat no. 23345 sheet no. 1149-3	2-11	-		_	_	_	-	-	1492	-	1494	-	-	_	_	_
Hylite 20	2-11	-	-	-	-	-	1432	-	1438	-	-	-	-	-		-
Hylite 30	2-II	-	-	-	-	-	1426, 1478	-	1442	-	-	-	-	-	-	-
Hylite 40	2-11	-	-	-	-	- 	1426. 1478	-	1442	-	-	-	-	-	-	-
Hylite 50	2-11	-	-	-	-	-	1432, 1482	-	1436	-	-	-	-	-	-	-
Hylite 55	2-II	-	-	-	-	-	1404	-	1486	-	-	-	-	-	-	-
Hyllte 60	2-11	-	-	-	-	-	1434	-	1486	-	-	-	·	•	-	-
MST-JMn	2-1	-	-	-	-	-	-	-		-	1481	-	-	-	-	-
RC-130A	2-1	-	-		-	-	521	523	525	1	522	-	533- 535	537	-	-
RC-330B	2-21	-	-		-	-	1426, 1478	-) - 	-	1450	-	-	-	-	-
RMI-8Mn	2-11	-	٠	-	-	-	-	-	-	-	1481	-	-	-	-	-
RMI-30	2-1	-	-	"	-	i -	-	-	-	-	517	-	-	! -		-
RMI-40	2-1	-	-	-] -	-	-	-	-	-	517	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expension	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Titanium alloys (special designations) (cont.)																
RM1-55	2-1	-	-	-	-	-	-	-	-	-	517	-	-	-	-	-
RMI-70	2-1	-	- 1	-	-	-	-	-	-	-	517	-	-	-	-	-
RS-120	2-1	-	-	-	-	-	-	-	-	-	-	-	531	-	-	-
Ti-140A	2-11	-	-	-	-	-	1472	-	1474	-	-	-	-	-	-	-
Ti-150A	2-11	-	-	-	-	-	-	-	1466	-	-	-	-	-	-	-
Ti-155A	2-II	-	- i	-	-	-	1432	-	1442	-	-	-	-	-	-	-
Titanium alloy 6 Al -4 V coated with Rokide C	6-11	-	-	-	-	-	-	-	-	-	-	-	1345- 1347	-	-	-
Titanum aluminide (TiAl)	6-1	27	27	-	-	-	-	-	-	-	-	-	29- 31	33	-	-
Titanium aluminide + Aluminum oxide	5	-	-	-	-	-	-	-	-	-	-	-	862- 864	866	-	-
Titanium beryllides	ll	1]													
TiBe	6-1	138	- i	-	-	-	-	-	-	-	-	-	-	-	_	-
TiBe ₂	6-1	138	- 1	-	-	-	-	-	-	-	-	~	-	_	-	-
TiBeg	6-1	-	-	-	-	-	-	140	142	-	-	-	-	-	-	-
Titanium borides	ll	1														
TiB	6-1	237	-	-	-	-	-	-	-	-	-	-	-		-	-
TiB ₂	6-1	236	236	-	-	-	238	240	242	-	244	-	246- 248	-	-	-
Ti ₂ B	6-1	- 1	236	-	-	-	-	-	-	-	-	-	-	-	-	-
Titsnium (di-)boride + + Aluminum boride	6-1	723	-	-	~	-	-	~	-	-		-	-	-	-	-
Titanium (di-)boride + + Boracic acid	ō	-	-	-	-	-	-	-	-	-	-	-	886- 888	890	-	-
Titanium (di-)boride + + Chromium (di-)boride	1-9	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (di-) boride + + (Penta-) niobium (tri-) - silicide	6-1	-	724	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (di-)boride + + Tantalum (di-)silicide	6-1	-	724	-	-	-	-	-	-	-	-	-	-	-	~	-
Titanium (di-)boride + + Titanium (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	892- 894	896	-	-
Titanium (di-)boride + - Titanium (di-)oxide + + Boracic acid	5	-	-	-	-	~	-	-	~	-	-	-	898- 900	902	-	-
Titanium (di-)boride + + Titanium nitride	5	-	-	-	_	-	-	-	-	-	801	-		-	-	-
Titanium (di-)boride + + Vansdium (di-)boride	6-1	723	-	-	-	-	-	-	-	-	-	-	-	~	-	-
litanium carbide (TiC)	5	176	176	-	-	-	178	180	182	1.85	187	-	189- 193	-	-	-
										L				L		

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimetica	Electrical Resistivity	Specific Hess	Thermal Conductivity	Thermal. Diffusivity	Thern.c. () .ear Expansion	Thermal Anarrhance	Theraal Eniitance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Titanium carbide + Cobalt cerraet	6-11	862	-	-	-	-	-	-	911	-	864	-	-	-	-	
TRansm carbide + Molybdemm + + Tungsten cermet	6-11	-	-	-	-	-	-	-	-	-	866	-	-	-	-	-
Titanium carbide + Nickel cermet	6-11	868	-	-	-	-	-	871	873	-	875-	-	-	-	-	-
Titanium carbide + Niobium carbide + Nickel cermet	6-11	_	-	_	_	_	-	_	911	-	877	-		_	-	_
Titanium carbide + Tungsten cermet	6-II	_	_	_	-	_	-	_	-	-	879	-	_		_	-
Titanium-chromium inter- metallics (TiCr ₂)	6-I	-	-	-	-	-	-	-	-	-	-	_	656-	660	-	-
Titanium-chr 'una intermetal- lics + Chrom.um (sesqui-)- oxide	5	-	-	-	-	-	-	-	-	-	926	-	658 928-	932	-	-
Titanium-chromium intermetal- lics + Chromium (sesqui-) - oxide + Thanium (di-)oxide	5	-	-	-	-	-	-		-	-	-	-	936 934~	93 8	-	-
Titarium-chromium intermetal- lics + Titanium (di-)oxide	5	-	-	-	-	-	-	-	-	-	-	-	936 940- 942	944	-	-
Titanium ferrides																
TiFe	6-1	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-
TiFe ₂	6-1	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium-gold intermetallics											l					
TiAu	6-1	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
TiAu ₂	6-1	•	684	-	-	-	-	-	-	-	-	-	-	-	-	-
TigAu	6- i 5	-	684		-	-	-	-	-	-	-	-	-	-	-	-
Titanium hydride (TiH) Titanium iodide (TiI2)				_		-	443	445	-	-	475	-	-	-	-	-
Titanium nitride (TiN)	5	- 571	- 571	_	-	-	- 573	- 575	577	- 579	475 581	-	584	-	-	-
Titanium nitride + Chromium +	6-11	-	5/1	-	_	-	-	-	-	-	909	-		_	-	-
Titanium nitride + Titanium (di-)boride	5	-	-	-	-	-	-	-	_	_	842	-	-	_	-	_
Titanium oxides										i						
TiO	4-1	-	-	-	-	446	-	452	-	-	462	-	_ i	-	-	479
тю ₂	4- <u>I</u>	445	445	-	-	446	450	454	460	-	462	465	467- 471	473- 475	477	479
Ti ₂ O ₃	4-1	-	-	-	-	-	-	456	-	-	-	-	-	-	-	-
Ti ₂ O ₅	4-1	-	-	-	-	-	-	458	-	-	-	-	-	-	-	479
Titanium (mon-) oxide + + Chromium-titanium alloys cermet	6-11	-	-	-	-	-	-	-	-	-	7 9 6	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Reat of Fusion	ifent ./f Vuporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorpance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vanor Pressure
Titanium (di-) oxide and alumi- num oxide coating on molybdenum	6-11	-	_	_	-	-	-	-	-	-	-	-	1395	-	1	-
fitanium (di-) oxide + Antimony (tri-) oxide	4-1	-	-	-	-	-	-	-	-	-	850	-	-	-	-	-
Titanium (di-) oxide + Beryllium oxide + Calcium titanium silicate + Magnesium oxide	4-II	_	_	_	-	-	-	-	-	-	1550	-	-	-	-	-
Titanium (di-)oxide + Lithium carbonate	4-11	-	-	-	-		-	-	~	-	1552	-	-	-	-	-
Titanium (di-)oxide + Manganese (di-)oxide	4-1	-	-	-	-	-	-	-	-	-	852	-	-		-	-
Titanium (di-)oxide + Niobium (pent-)oxide	4- <u>1</u>	-	854	· ·	-	-	-	-	•	-	856	-	-	-	-	-
Titanium (di-) oxide + Silicon (di-) oxide	4-1	-	-	-	-	-	858	-	· _	-	860	-	-	-	-	-
Titanium (di-) oxide + Strontium oxide	4-1	-	862	-	-	-	-	-	-	-	~	-	-	-		-
oxide Titanium (di-)oxide + Titanium	4-I	-	-	-	-	-	-	-	-	-	864	-	-	-	-	-
(di-)boride	5	-	-	-	-	-	-	-	-	-	-	-	791- 793	796	-	-
Titsnium (di-)oxide + Tungsten (tri-)oxide	4-1	-	-	-	-	-	-	-	-	-	866	-	-	-	-	-
Titsnium (di-)oxide + Vansdium (pent-)oxide	4-1	-	-	-	-	-	-	-	-	-	858- 870	-	-	-	-	-
Titanium (di-)oxide + Zirconium (di-)oxide ,	4-1	_	-	-	-	-	-	-	-	-	872		-	-	-	-
Titanium phosphates										1						•
TiO ₂ ·P ₂ O ₅	4-II	-	-	-	-	-	-	-	- 1	-	1151	-	- 1	-	-	-
5 TiO ₂ · 2 P ₂ O ₅	4-II	-	~	-	-	-	-	-		-	1181	-	-	-	- 1	-
Titanium phosphide (TiP)	5	635	636	-	-	-	639	-	-	-	-	-	-	-	-	-
Titanium silicides													!		İ	1
TiSi	6-1	-	477		-	-	-	481	-	-	483	<u> </u>	-		-	Ι.
TiSi ₂	6-1	479	478	-	-	-	-	481	-	ļ -	483	`	485- 487	489	-	•
TigSig	6-1	~	479	-	-	-	-	481	-	-	483	-	- 	489	-	
+ (Penta-)titanium (tri-) - silicide	6-1	-	-	-	-	-	-	-	-	-	-	-	693- 695	697	-	
(Penta-) ilianium (tri-) silicide + + Titanium (di-) silicide	F-9	-	-	-	-	-	-	-	-	-	-	-	699- 701	703	-	
Titanium tungsten (di-) carbide + + Cobalt cermet	II-9	-	-	-	-	-	-	-	-	-	881	-	-	-	_	
Titanium tungsten (di-) carbide + + Tantalum cermet	6-II	-	-	-	-	-	-	-	-	-	8.53	-	-	-	-	

Material Name	Volume	Density	Melting Point	licat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Kosistivity	Specific Heat	Therinal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Titanox TG	4-1	-	_	•			•	-			462				1	-
Transite	6-II	-	-	-	-	-	-	1216	-	-	-	-	-	-	-	-
Tremolite	4-11	-	-	-	-	_ '	-	1239	- 1	-	-	-	-	-	-	-
Trolitul Lav-M150	6-11	-	-	-	-	-	-	970	972	1082	-	-	-	-	-	-
Tungstea (W)	1	1019	1019	-	-	-	1021	1023	1025	1027	1029	-	1031- 1033	1040- 1042	-	1044
Tungsten, lamp grade	1	-	_	-	-	-	-	_	_	-	-	_	1038	-	-	-
Tungsten coated with hafnium (di-) oxide	6-11	-	-	-	-	-	-	-	-	-	-	-	1377- 1379	-	-	-
Tungsten coated with silicide	6-II	-	-	-	-	-	-	-	-	-	-	-	1495- 1487	1499	-	-
Tungsien costing on Incomel X .	6-11	-	-	-	-	-	-	-	-	-	-	-	1329	1331	¦ -	-
Tungsten coating on iron	6-11	-	-	-	-	-	-	-	-	-	-	1325	1327	-	-	-
Tungsten $+\Sigma X_i$	2-11	1516	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten + Cobalt	2-3	-	-	-	-	-	-	-	-	-	565	-	-	-	-	-
Tungsten + Copper	2- <u>I</u>	-	-	-	-	-	-	-	-] -	567	-	-	-	-	-
Tungsten + Molybdenum	2-1	-	-	-	-	-	-	-	-	-	-	-	569- 573	-	-	-
Tungsten + Nickel + EX _i	2-11	[-	-	-	-	-	-	1512	-	1514	-	-	-	-	-
Tungsten + Niobium	2-1	-	575	-	-	-		-	-	-	-	-	-	-	-	-
Tungsten + Rhenium	2- <u>I</u>	-	-	-	-	-	577	-	-	-	-	-	-	- 1	-	-
Tungsten alloys (special design.)	I	-	-	-	-	-	-	-	-	-	1514	-	-	-	-	-
B50YA12B	2-11	-	-	-	-	-	-	-	j -	-	1514	-	-	-	-	-
Heavy alky	2-II :2-II	-	-	-	-	-	-	-		-	1514	-]	-	_	-
Mallory 1000	6-1		43		_										_	
Tungsten animinute (WAA)	(-I	_		_	_	_	96	_	_	_	_	_			i _	_
Tungsten borides	` '								İ		. ·					
WB	6-1	-	250	_	_	_	252	254	258	260	262	- 1	264	_	_	_
WB ₂	6-1	-	250	-	-	-	-	-	-	-	-	-	-	-	_	_
W ₂ B	6-1	-	250	-	-	-	-	256	-	-	-	-	-	-	-	_
W ₂ B ₂	6-1	-	250	-	-	-	-	256	-	-	-	-	-	-	-	! -
Tungsten carbides														l	l	
S	5	195	195	-	-	-	197	199	201	-	203	-	205- 209	-	-	215
W₂C	5	-	195	-	-	-	-	-	-	- 	203	-	211- 213	-	-	-
Tungsten carbide coating on iron	e-11	-	-	-	-	-	-	-	-	-	-	1421	1423	-	-	-
Tungsten carbide + Chromium~ cobelt alloys cermet	6-11	-	-	-	-	-	-	-	-	-	895	-	-	-	-	-
Tungsten carbide + Cobalt cermet	6-11	-	-	-	-	-	-	 	839	-	807- 905	-	-	-	-	-
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Material Name	Volume	Density	Molting Point	liest of Fusion	lieat of Vaporization	liont of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Tungsten carbide + Nickel cermet	6-II	-	-	-	-	-	-	-	-	-	907	-	-	-	-	-
Tungsten-cobalt alloy coating on Incomel X	6-11	-	-	-	-	-	-	-	-	-	-	-	1341	1342	-	-
Tungsten-cobalt intermetallics (WCo ₂)	5-I	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten iron lead oxide (3 PbO·Fe ₂ O ₃ ·WO ₃)	4-11	-	-	-	-	-	-	-	-	-	1159	-	-	-	-	-
Tungsten nitride (WN)	5	-	521	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten oxides]					
wo₂	4-1	-	-	-	-	-	-	-	-	-	465	-	-	-	-	-
WO ₂	4-1	-	-	-	-	-	-	481	483	-	485	-	-	-	-	-
W ₁₈ O ₄₉	4-2	-	-	-	-	-	-	-	-	-	485	-	-	-	-	-
W ₂₃ O ₃₆	4-1	-	-	-	-	-	-	-	-	-	485	-	-	-	-	-
Tungsten (tri-) oxide + Zinc oxide	4-1	-	-	-	-	-	-	-	874	-	-	-	-	-	-	-
Tungst .n phosphide (WP)	5	635	636	-	-	-	639	-	-	-	-	-	-	-	-	-
Tungsten selenide (WSo ₂)	i ^ş -1	-	-	-	-	-	259	-	361	-	-	-	-	-	-	-
Tangaten seienide tellurides (WSe _{2-X} Te _X)	6-1	-	-	-	-	-	634	-	-	-	-	-	-	-	-	-
Tungsten silicides														Ì.		
WSI	F-3	-	491	- :	-	-	-	-	-	-	-	-	i - 1	-	-	-
WSi ₂	6-I	~	491	-	-	-	-	453	495	-	457	-	-	499	-	-
W _g Si₂	6-1	-	491	-	-	-	-	-	-	-	-	-	-	-	-	-
W ₂ Si ₃	6-1	-	491	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten tellurides (WTe.)	6-1	-	-	-	-	-	638	-	640	-	-	-	-	-	-	-
Tungsten-zirconum intermetal- lics (W ₂ Zr)	6-1	-	684	-	-	-	-	-	-	-	-	-	-	-	-	-
v																
Udimet 500	2.41	-	-	-	-	-	-	-	1134	-	-	-	1201. 1233	1213, 1235	-	-
Udimet 600	2-11	-	-	-	-	-	-	-	1134	-	-	-	-	-	-	-
Uranium (U)	1	1046	1046	-	-	-	1049	1051	1053	1056	1058	-	1061- 1063	-	-	-
Uranium + ΣX_1	2-11		-	1544	1544	1544	-	-	-	-	-	-	-	-	-	1546
Uranium + Chromium	2-1	579	579	-	-	-	581	583	585	-	557	-	-	-	-	-
Uranium + Iron	2-3	589	-	-	-	-	-	-	-	-	593	-	-	-	-	-
Ucanium + Magnesium	2-3	-	-	-	-	-	-	-	593	-	595	-	-	-	-	-
Ursnium + Molybdenum	2- i	599	597	-	-	-	601	603	605	-	607- 613	-	-	-	-	-
Uranium + Molybrienum + ΣX_i	2-11	-	1518	-	-	-	-	-	1520	-	1522- 1526	-	-	-	-	-
Uranium + Niobium	2-1	-	617	-	-	-	-	-	619	-	·	-	621- 623	-	-	-
Uranium + Platonium + $\sum X_{ij}$	2-[]	-	1528	-	-	-	-	-	-	-	1530	-	-	-	-	-
L				<u> </u>	<u> </u>	<u> </u>			<u> </u>	<u></u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>	

Name	Volume	Density	Melting Point	iteat of Fusion	Brat of Vaporization	Heat of Sublimation	Electrical Resistitity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittence	Vapor Pressure
Uranium + Thorium + ∑X ₁ Uranium + Ziroonium	2- <u>11</u> 2-1	- 625	1532	-	-	-	- 627	-	-	-	- 631-		-	-	-	-
Uranium + Zirconium + ∑X _i	2- <u>II</u>	_	1534	_	_	_	1536		1538		641	_	1540-	_		
Uranium alloys (special design.)													1542			
Pissiam alloy	2-11	-	1518	_		_	L L	_	1520	l _	_	_	_	_	_	_
U-3% F8	2-11	_	_	_	_	_	_	_	1520			-				
U-5% F8	2-11	_	_	_	_	_	_	_	1520	_		_	_	_	_	_
U-5% FS-2.25 Zr	2-11	_	_	_	_	_	_	_	1538			_		-		
U-6% FS	2-11	_	_	_	_	_		_	1520	_		_	_			Ĭ _
U-10% PS	2-11	_	_		_	_	_	_	1520			-	_]	_	٦.
Uranium aluminides																
UAJ ₂	6-1	35	35	-	-	-	_	_	_	_	37	-	_	_	_	_
UAl ₂	6 1	35	35	_	_	-	_	_	-	_		_	_	_		_
UA!	6-1	35	_	_	_	_	_	_	_	_	_	_	_	_	_	
Uranium beryllide (UBen)	6-1	144	_	-	-	_	_	_	146	_	_	_	_	_	_	
Uranium-bienuth intermetallics																
UBI	6-1	676	676	_	_	_	-		_	_	_	_		_		_
UBi ₂	6-1	576	676	_	_	_	_	_	-	_		_	_	_	_	-
U ₂ Bi ₄	6-1	676	÷76	۱.	_	_	_	_	_	_	_	_	_	_	i _ ;	
U _a Bi _a	6-1	676	_	١.	_	_		_	_	_	_	-		_		
Uranium borides				i										-	-	-
UB ₂	6-1	_	266	_		_	_	_	_	_	268	_	_	_	_	_
UB ₄	6-1	265	266	١.	_	_		_	_	_	_	_	_			
UB _m	6-1	_	266	١.	_	_	_	_				_	_	_	_	_
Uranium brodido (UBr ₂)	5	11	-	-		-	_	_	_	_	_	_	_	_	-	_
Uranium carbides																
UC	5	217	217	-	-	-	219	223	231	235	237	-	243, 245	-	-	-
υC₂	5	-	217	-	-	-	221	225- 227	233	-	239	-	243- 245	-	-	-
U ₂ C ₃	5	217	217	-	-	-	-	229	-	-	242	-	-	-	-	-
Uranium (mono-) carbide + + Molybdenum cermet	6-E	-	-	-	-	-	-	-	-	-	591	-	-	-	-	-
Uranium (mono-) carbide + +Uranium cormet	6-11	_									893					
Uranium (di-)carbide + Graphite		_		-	-	-	-	_	743		مده	-	-	-	-	-
Uranium chlorides														•		_
	5	335	_	_ :	_	_	_	337							_	
UCI ₂	5	335				_		337		-				_	ļ <u> </u>	-
Uranium-cobalt intermetallics		سی						331	-		_	_				-
UCo	6-;	676		_	_											
	6-1	676					-	-		-	-	•	-	-	- 1	-
U _t Co		019	-	-	•	-	-	-	-	-	-	-	-	-	-	-

THE REPORT OF THE PERSON

Material Name	Volume	Denaity	Melting brint	Heat of Fusion	Heat of Vaporization	Heat of Rabitmetton	Electrical Resistivity	Specific Heat	Therian! Conductivity	Thormal Mffiulvity	Thormal Linear Expunsion	Thermal Absorpance	Thermal Kinittanon	Thormal Ruffectance	Thermal Transmintance	Vapor Pressure
U: wha ferrides																
UFe ₂	6-3	366	366	-	-	-	-	-	-	-	-	-	-	-	-	_
tyre	6-1	395	366	-	-	-	-	-	-	-	-	-	-		-	-
Cranium Bacrides																
· · · · · · · · · · · · · · · · · · ·	5	-	497	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	467	407	-	-	-	-	-	-	-	-	-	-	-	-	-
Franksa hydride (CH ₃) Uranium iodides	5	467	-	-	-	-	-	413	-	-	-	-	-	-	-	-
U,	5	-	477	_	_	_	-	-		_	-	-	_		_	
<u> </u>	s	_	477	_	_	_	_	_	_		_	_	_	-	_]
Grantum-lead intermetallies												-	_	_	-	Ī
υ ρ 5	6-Z	676	676	-	-	_	-	-	_	_	-	_	_	_	-	_
up.	6-3	ese	576	-	-	-	_	_	-	_	-	-	_	-	_	_
Urmian-magazese internetal-	li															
lics UMs ₂	6-1	576	636													
•	6-1	57C	626	-	-	-	-	- !	-	-	-	-	-	-	-	-
Fra-lass-nickel intermetallics		•	•/•	-	-	-	-	~	-	-	-	-	-	-	-	-
	6-3	£76	-	-	-	-	-	-	-	-	-	-	-	-	-	_
Cranium ržizides																
	5	596	596	-	-	-	-	-	565	586	582	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
	ة .	563	-	-	-	-	-	-	-	-	-	-	-	-	•	-
U ₂ N ₂	5	55E	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6-3	453	459		-	-	633	435	583- 511	515	517	-	529	-	-	52
00 _{2.47-2-28}	4-3	-	-	-	-	-	-	-	505	-	517	-	-	-	-	-
1003	44	458	459	-	-	-	-	497	-	-	-	-	-	-	-	-
E ₂ O ₃	4-3	-	-	-	-	-	433	-	-	-	-	-	-	-	-	-
	4-1	453	-	-	-	-	-	-	~	-	-	-	-	-	-	-
	4-7	455	455	-	-	-	-	439	525	-	-	-	-	-	-	-
* *	4-3	-	-	-	-	-	-	592		-	-	-	-	-	-	-
Uranium (di-)oxide powder Uranium (di-)oxide + Beryllum	r	-	-	-	-	-	-	-	533	-	-	-	236	-	-	-
	4-3	-	-	-	-	-	-	-	\$76	-	\$7E	-	-	-	-	-
Granian (di-)ouide + Chronium cernet	6- <u>2</u> 2	-	-	-	-	-	795	-	590	-	9 42	-	-	-	_	-
Urantum (di-)estde + + Dysprosium oxide	4-2	-	-	-	_	_	-	-	_	~	596	_		_	_	<u> </u>
Crambum (do-) sedde + Graphite .	5	-	-	-	-	_	-	-	741	-	-	-	_	-	-]
Dranium (di-)oxide + → Magnesium oxide	4-7	-	-	-	_	-	-	-	-	-	852	-	_	_	_	-
Granium (di-jordée + - Mohrdenum cermet	4.2		-	-	-	-	994	-	906	-	901	-	_	_	-	_

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expension	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Uranium (di-)oxide + Niobium cermet	6-D	_	-	_		_	810	_	812		-		_	_		_
Uranium (di-)oxide + Stainless steel cermet	6-11	-	_	_	-		814	_	816		818	_	_			
Uranium (di-)oxide + Thorium (di-)oxide	4-1	_	-	_	_	_	884	_				-				
Uranium (d) oxide + Thorium (di-) oxide + Yttrium oxide	4-I	_	_	_	_						-	-	-	-	-	
Uranium (di-)c ide + Yttrium oxide	4-I	_		_	ĺ	-	-	-	•	-	-	-	-	-	-	886
Uranium (di-)oxide + + Zirconium cermet	6-II	820	-	1	-	-	-	-	-	-	-	-	-	-	-	888
Uranium (di-)oxide + + Zirconium (di-)oxide			-	-	-	-	-	-	822	-	824	-	-	-	-	-
Uranium phosphate (UO ₂ · P ₂ O ₃)	4-I 4-II	-	890	-	-	-	-	-	-	-	892	-	-	- ,	-	!
Uranium plutonium carbide		_	-	-	-	-	-	_	-	-	1183	-	-	-	-] -
(U _{1-X} Pu _X C)	5	-	I -	-	-	<u> </u>	247	-	-	-	-	-	-	-	-	
Uranium silicides			1			Ì	l									1
USI	6-I	501	501	-	-	-	-	-	-	-	509	-	-	-	-	-
USi ₂	6-1	501	501	-	-	-	-	505	-	-	509	-	-	-	-	-
USi ₃	6-1	501	501	-	-	-	503	505	-	-	509	-	-	-	-	-
U₃Si	6 - I	501	501	-	-	-	503	505	507	-	509	-	-	-	_	-
U ₂ Si ₂	6-1	501	501	-	i -	-	-	-	-	-	509	-	-		-	- 1
Uranium stannide (USn ₂)	6-I	541	-	-	-	-	-	-	-	-	-	_	-	-	_	-
Ur. nium sulfides]							
us	5	722	722	-	-	-	-	-	-	-	724	-	-	-	_	-
US₂	5	722	722	-	-	-	-	-	-	-	-	-	-	-	_	-
Uranium thorium oxide (Th _{1-X} U _X O ₂)	4-11	-	-	-	-	-	-	_	1161	_	_	_	_	 -	_	_
Uranium-titanium intermetallics (U2Ti)	6-1	-	676	-		-		-	_	_	_	_	_		_	_
Uranium zirconium carbide (U _{1-X} Zr _X C)	5	-	-	_	-	-	_	-	_	_	- -		249		-	
Uranium zirconium hydride (U _{1-X} Zr _X H)	5	_	-	_	_	_	_	_		_	451			_	_	
Uranyl oxide	4-1	488	489	_ i	_	_	ا ہ	497	_	_		_	_	_		
Urea formaldehyde, alpn.	6-n	_	_	-	_	_	_	_		_	1002	_		_		_
v						ĺ				İ				-	-	
Vanadate glass	,	İ								I		ļ	ļ	ĺ	į	l
- <u>-</u>	4-11		-	-	-	-	1645	-	-	-	1647	-	-	-	- 1	-
1	- 1	1065	1065	-	-	1065	1067	1069	1071	-	1073	-	1075	1077	-	1079
•	2-I	-	-	-	-	-	643	-	-	-	-]	-	- ¦	-	-	-
	2-I	-	-	^	-	-	643	-	-	-	-	-	-	-	- [-
•	2-1	-	-	-	-	- !	643	-	-	-	-	-	-	- [-	-
Vanadium + Chromium	2-I	- [-	-	-	-	643	-	- {	-	-	-	-	-	-	-
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of	Vaporization Heat of	Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal	Thermal Linear Expansion	Thermal	Thermal	Emittance	Reflectance	Thermal Transmittance	Vamr Brassur
	2-I	-	-	-	-	.	.	643	_	_		1	T		+	7		+
Vanadium + Iron	2-1	-	-	-	-	.	.	643	_	١.	-	ı	-	-		-	-	-
Monadam	2-I	-	-	-	-	1.	.]	643	_		-	-	-	-		-	-	-
Vanadium + Nickel	2-1	-	-	-	-	-	.	643	_			-	-	-	- [-	-	-
Vanadium + Palladium	2-I	-	-	-	-	-	.	643	_	_		Ì	-	-	-	-	-	-
	2-1	-	-	-	-	-	.	_	_	-		645	-	-	j.	-	-	-
Vanadium + Silicon + ∑X _i Vanadium + Tin	1	- !	-	-	-	-	-	-	-	1548		-		-		-	-	-
		-	-	-	-	-		643	_	-) - 1	-	1 '		-	-
Vanadium + Titanium	2-1	647	-	-	-	-		643	_	649	_	651	-	-	'	- 1	-	-
$Vanadium + Titanium + \Sigma X_1 \dots Yanadium + Zirconium \dots Yanadium + Zirconium \dots Yanadium + Zirconium Yanadium + Zirconium Yanadium + Zirconi$	2-11	-	-	-	-	-		-	_	1550		-	-	-	-	- 1	-	-
Vanadium aluminista (27.4.)	2-1	-	-	-	-	-	-10	343	-	_	_		_	-	-	ı	-	-
Vanadium aluminide (VgAl-) (Vanadium beryllide (VBe ₁₂) (5-1	- 1	43	-	-	-		- [-	-	_	_		_	-	- 1	-	~
Varadium borides	3-1	-	158	-	-	-		-	-	-	_	_	_	_	-		-	-
VB .			- 1			1		ı	- 1	i			_	_	-		-	-
VD	-I	-	270	-	-	-		-	-	-	_	_	_	_	i			
V B	1	270	270	-	-	-		-	-	-	-	272	_	_	-		-	-
	-1	-	270	-	-	-	.	-	-	-	_		_	_	-		-	-
Vanadium (di-)boride +	-1	-	270	-	-	i -	.	-	-	_	- i	_	_	_	-		-	-
+ Chromium (di-)boride 6	٠١,	723								- 1	I		-	-	-	1	-	-
Vanadium (di-)boride + + Titanium (di-)boride 6.	- 1	723	-	-	-	-	'	-	-	-	-	-	-	-	-		-	-
Vanadium carbides		1			_	-	'		-	-	-	-	-	-	~		- 1	-
vc5	2	251	251	-	_	_	2											
V ₂ C5	j	- Ì	251	-	_		1		258	257	-	259	-	261	-	1	-	-
Vanadium germanium lead oxide (5 PbO · GeO ₂ · V ₂ O ₂)	U.	-	-	-	~	_				-	-	259	-	_	-		-	-
Vanadium hydride (VH) 5	_ j ·	-	-	-	-	_	-	1.	153	- 1	-	1163	-	-	-	.	-	-
Vanadium-manganese inter- metallics (VMn ₂)			1	- 1			ļ	- `	-~-	-	i	-	-	-	-	.	.	-
Vanadium nuride (VN)	- I	- 1	683	-	-	-	-		-	-	-	-		_				
Varadium oxides	15	36	596	-	-	-	ļ -	8	98	-	-	600			_	'	-	-
VO.	.				- 1					- 1				-	•	'		-
V ₂ O ₃	j	.	-	-	-	524	-	; 5	28	-	_ !	_	_	_			1.	536
V ₂ O ₄	- 1	.	-	-	-	-	520	: ļ 5	30	-	-	-	_	-	-	1 -		~~
V ₂ O ₂		. .	-	-	-	-	-	5	32	-	-	-	_		_	1		٠
Vanadium (pent-)oxide +	52	~ *	24	-	-	-	526	5 5	34	-	-	-	-	_	•	1 -		
+ Titanium (di-)oxide 4-1			_	_	_	_ [i	1		_ j		l		-		
Vanadium phoephide (VP) S	63	5 6		- 1	_		639	-	ļ	-	1	394	-	-	-	١.		-
Vanadium silicides	ļ					-	021	-		-	" j	-	-	-	-	-	1	- [
`Si 6-I	-	5	11	.	_							ļ				Ì		
VSi ₂ 6-1	1	[.	. .	.			-			- 1	-	- [-	-	-	ļ -		-
V ₂ Si 6-1	-	5		_	_		-	5.	1	- ! 1		515	-	-	-	-	1.	-
V ₂ Si ₂	1	ŧ	11			-	-	1		-		515	-	-	-	j -		-
1	1	1	-l .	1	-	-	-	51	3 .	.	- 1	515	- İ	_	_	ı	- [.

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	The rmal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Therraal Reflectance	Thermal Transmittance	Vapor Prossure
Vanadium silicon lead oxide (5 PbO·SiO ₂ ·V ₂ O ₃)	4-11	-	-	-	-	-	-	-	-	-	1165	-	-	-	-	
Vanadium-zirconium inter- metallics (V ₂ Zr)	6-I	_	685	_	_	1.]_	_	_					l		
Vermiculite, expanded	4-i	_	-					i	814		-	-	-	_	-	-
Vinylito VMCH	6-11	_	_				Ī _] [-	-	- 950	-	· -	-	-	-
Vinylite VYDR	6-11		_	_	_	_					930	-	-	-	-	-
Vitreous bonded aluminum titenate	5	-	_	-	-	_	949- 953	_	-	-	555 -	-	-	-		
Vulcollan	6-11	1951	_	_	_	_	303	۱.	_	_	977					1
Vycor no. 790	4-11	_	1651	-	_	-	1653	-		-	1663	-	-	-	-	-
Vycor 7900	4-II	-	-	-	-	-	-	1655	-	1661	-	-	1665	1669	1671- 1673	-
Vycor glasses	4-II	1651	1651	-	-	-	1653	1655	1657, 1699	1659- 1861	1663	-	1665- 1667	1669	1671- 1673	-
W																
											İ					
Willemite	4-11	-	-	-	-	j -	-	1340	i -	-	-	-	-	-	-	-
Wustite	4-II 4-I	-	-	-	-	-	-	1229	-	-		-	-	-	-	-
	3-3	-	-	! -	-	-	-	-	-	ì -	222	-	-	-	-	-
Y			i								İ					
Ytterbia	١, ,	538							l							
Ytterbium (Yb)	4-ī	1081	- 1081	1081	1081	108i	-	540	-	-	502	-	-	-	544	-
Ytterbium + Calcium	2-1	1001	1001	1001	1001	1091		1085	-	-	-	-	-	-	-	-
Ytterbium berides			_	-] -	-	-	-	-	-	653	-	-	-	-	-
YbB4	6-1	295	_	_	_	_	_		_		_	_				
YbB _{\$}	6-1	295	-	-	_	_	300	_	_	-	.	_	_	-	-	-
Yttertium carbide (YbC ₂)	5	294	-	-	-	l - i	_	_	_	_	_]		_]	-	
Ytterbium oxide (Y52O2)	4-I	538	-	-	-		-	540	-		542	_	_	_	544	
	6-I	365	-	-	-	-	-	-	-	-	۔ ا	_	- Ì	_	-	_
Ytterbium sulfide (Yb ₂ S ₂)		732	-	-	-	-	-	-	-	-	-]	-	-	-	-	-
Yttria		546	-	-	-	-	-	548	550	-	552	-	555- 559	-	561	-
Yttrium (Y)	E	1087		1087		1987	1089	1091	1093	<u>-</u>	-	-	1095	- j	-	1697
Ytrium + Tantalum			_	•	-	-	-	1554	-	1556	-	- [-	.	-	-
Y:trium + Terbium		-	-	-	-	-	- 657	655	-	-	-	-	-	-	-	-
Yttrium + Terbium + ΣX_i		1552	_	-	-	-	- 691	_	-	-	-	-	-	-	-	-
Yttrium bocides			-	-	•	-	-	-	-	•	-	-	-	-	-	-
YB ₂	6-1	295	297	_	_	-	_	_			_		_			I
*	6-I	295	297	-	_	_	_	_			_		-	_		-
	İ										-			-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vanorization	Foat of	Electrical	Specific Heat	Thermal	Conductivity	Directivity Thermal Linear	Expansion Thermal	Thermal Emittance	Thermal	Thermal	- The military Co	Vapor Pressure
Yttrium borides (cont.)								T				+ 5	+		+	+	_
YB,	6-I	295	297	-	-	-	300	- 1	-	_	_	_	_	1			
Yttrium carbides	1	l				1	1					-	-	-	-	-]
YC	5	-	295	-	-	-	-	-	_	-	1_	_	_	1_			ı
YC ₂	5	294	295	-	-	-	-	-	-	-	1 -	_			-	-	- 1
Y ₂ C ₃	5	-	295	-	-	-	-	-	-	-	1 -	_			-	-	
Y ₁ C	5	294	-	-	! -	Ì -	j -	-	_	1 -	_	1_			-	-	
Yttrium-cobalt intermetallics		l	[l	1					İ	1			-	-	1 -	- 1
YCo ₂	6-I	681	-	-	-	-	-	-	-	-	_	1 -	1.	_			ı
YCo ₅	6-I	681	-	-	! -	-	-	-	-	_	1 -	_					
Yttrium-copper intermetallics (YCu _s)	6-1	£0.		l								1	1		1	-	
Yttrium ferride (YFe _s)	6-1	681 306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ı
Yttrium fluoride (YF2)	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 1
Yttrium-gallium intermetaliics	ľ	407	407	[-	-	-	-	-	-	-	-	-	-	-	-	-	- 1
(YGa ₂)	6-1	681	_	_	_		_	l				1				1	- 1
Yttrium germanides (YgGe3)	6-1	323	-	_	_			-	-	-	-	-	-	-	-	-	-
Yttrium hydrides	i					_	-	-	-	-	-	-	! -	-	j -	-	
YH ₂	5	455	_	-	_	_	۱.			1			l	l	l	1	1
YН3	5	455	_	_		_	!	-	į -	-	-	-	-	-	-	-	ı
Yttrium-manganese intermetai- lics						_	•	457	-	-	-	-	-	-	-	-	
YMn ₂	5-I	681	-	-	-		_	l _	_	_	1	l				l	
	6-1 [681	- 1	-	- 1	- 1	_	١.				-	-	-	-	-	1
Yttrium-nickel intermetallics (YNi ₅)	6-1	681	-	-	_	_	_					-	-	-	-	-	
Yttrium nitride (YN)	5	621	621	-	-	-				-	l	-	-	-	-	-	ĺ
Yttrium-osmium intermetallics (YOs ₂)		Ì		ļ	1	1		-	-	-	-	-	-	-	-	-	
	6-1	681	-	-	-	-	-	-	-	-	-	-	_	_	_		1
Yttrium oxide (Y ₂ O ₃) Yttrium oxide + Chromium	4-1	546	-	-	-	-	-	548	550	-	552	-	555- 550	-	561	-	
	4-1	-	-	-	-	-	-	-	-	-	-	-	896	-	-	-	
	4-1	-	-	-	-	-	-	-	898	-	-	-	-	-	-	-	
(YRh)	6-1	881	-	-	-	-	-	_	_	_							1
Yttrium silicides					- 1	i				- 1	-	-	-	-	-	-	1
Y81	6-1	523	524	-	-	- 1	_	_	_		j	- 1	- 1	- 1			
YSi ₂	6-1	523	524	-	- [_	-	_		-	-	-	-	-	-	-	1
Y ₂ Si ₅	6-1	-	524	-	- ;	_				_	-	-	-	-	-	•	1
	6-1	523	524	-	_	.		_		i	-	-	-	-	-	-	
Yttrium-silver intermetallics					Ì	ļ	_	- 1	-	-	-	-	- 1	-	-	-	
(YAg)	F-1	681	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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Material Name	Volume	Density	Melting Point	Heat of Fusion	Hoat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Yttrium sulfides																ı
YS	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	- [
YS ₂	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Y ₂ S ₃	5	732	732	-	-	-	-	-	-	-	-	-	-	-	-	-
Y ₂ S ₇	5	732	732	-	-	-	-	-	-	-	- 1	-	-	-	-	-
Yttrium tellurides (Y2Te3)	6-1	-	-	-	-	-	638	-	-	-	-	-	-	-	-	-
Z																
Zinc + Copper	2- <u>I</u>	-	-	_	ļ _		659	_	_	-	-	_	-	_	-	i - I
Zinc + Silver	2-1	-	661	661	- i	-	-	-	- 1	-	-	-	-	-	-	
Zinc + Zirconium	2-I	-	-	-	-	-	-	-	-	-	_	-	_	-	-	663
Zinc aluminate (ZnO-Al ₂ O ₂)	4-11	-	-	-	-	-	-	-	-	_	1033	_	_		_	-
Zinc antimonide (ZnSb)	6-I	-	-	_	_	_	75	_	77	-	-	_	_	_	- 1	79
Zinc chromate (ZnO·Cr ₂ O ₂)	4-11	-	-	-	_	-	-	-	-	-	1063	_	_	-	-	-
Zinc chromate spinal	4-11	_	- :	_	-	-	-	-	-	-	1063	_	_	-	_	- 1
Zinc ferrite (ZnO·Fe ₂ O ₂)	4-11	-	_	-	-	_	1099	1101	1103	-	1105	_	-	-	_	- 1
Zinc fluoride (ZnF2)	5	407	407	_	-	-	-	_ '	-	-	_	_	-	-	_	_
Zinc germanide oxide (2 ZnO·GeO ₂)	4-11	-	-	_	_	_	_	-	_	_	1167	-	-	-	-	-
Zinc germanium oxide + + Magnesium germanium oxide.	4-11	-	_	-	_	-	-	_ `	-	_	1556	-	-	-	-	-
Zinc germanium oxide + Zinc (crtho-) silicate	4-11	-	-	-	_		_	_	_	-	1558	-	-	-	-	-
Zinc lead silicate glass	4-11	-	-	-		-	1825	! -	-	-	-	-	-	-	- '	-
Zine magnesium alumicum borosilicate glass	4-11	-	-	-	-	-	-	_	-	-	1727	-	-	-	-	-
Zinc oxide (ZiO)	4-I	-	_	-	-	! -	563	-	565	-	567	-	569	-	-	-
Zinc oxide + Magnesium oxide .	4-1	-	-	-	-	-	-	-	900	-	-	-	-	-	- 1	-
Zinc oxide + Strontsum oxide + + Lithium zirconium silicate .	4-11		-	-	-	-	-	-	1554	-	-	-	-	-	-	-
Zinc oxide + Tin(ic) oxide	4-1	- ;	-	-	-	-	-	-	962	-	-	-	-	-	-	- I
Zine oxide + Tin(ic) oxide + + Magnesium oxide	4-3	-	-	-	-	-	-	-	904	-	-	-	-	-	-	-
Zinc selenide (ZnSe)	6-1	-	-	-	-	-	-	-	-	-	363	-	-	-	-	-
•	4-11	-	-	-	-	-	-	1340	-	-	1342	-	-	-	-	-
Zinc (ortho-)silicate + + Magnesium (ortho-)silicate .	4-11	-	-	-	-	-	-	-	-	-	1575	-	-	-	-	-
Zinc sulfide (ZaS)	5	-	-	-	-	-	726	-	-	-	-	-	-	728- 730	-	-
Zinc (ortho-)titanate (2 ZnO-TiO ₂)	4-11	-	_	_	_	_	_	1468	۱.	-	-	_	-	_	_	_
Zircaloy 2	2-1	-	-	-	-	-	599	702	704	-	-	-	709- 714	-	-	-
Zircaloy 2, low nickel	2- I	-	-	-	-	-	-	702	-	-	-	-	-	-	-	-

Material Name	Volume	Density	Melting Point	Heat of Fusion	Hoat of Vaporization	Hoat of Subitmation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermal Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressura
Zircaloy 4	2-I	-	-	_	-	-	-	702	-	-	-	_	-	_	-	-
Zircon	4-II	1344	-	-	- 1	-	1346	1348	-	-	-	-	-	-	-	_
Zircon 475	4-II	1344	-	-	-	-	~	-	-	-	-	-	- 1	-	-	-
Zircon CZ-5, Taylor	4-II	-	-	-	-	-	-	1348	1350	-	1352	-	- 1	-	_	-
Zircon + Beryl	4-II	-	-	-	-	-	-	-	-	-	1577	_	-	-	-	-
Zirconis	4-]	571	571	-	-	571	574	576	578	580	582- 587	-	589- 5 9 3	595	-	59
Zirconium (Zr)	1	1099	1099	-	-	1099	1102	1104	1106	1109	1111	-	1113- 1117	-	-	111
Zirconium no. 715	1	-	-	-	-	••	-	-	1105	-	-	-	-	-	-	-
Zirconium + ΣX _i	2-11	1580	-	-	-	-	1582	-	1584	-	1586	-	_	-	_	-
Ziroonium + Aluminum	2-1	-	-	-	-	-	665	-	657	-	-	-	-	_	l -	-
Zin:onium + Aluminum + XX;	2-II	1558	-	-	_	-	1560	-	1562	-	-	-	-	-	_	۱.
- 1	2-1	669	-	-	-	-	-	-	-	-	-	-	-	-	-	l -
Zirconium + Hafnium	2-1	671	_	_	_	671	673	575	_	_	677	_	_	_	_	١.
Zirconicta + Hafnium + EX;	2- II	_	_	_	_	_	_	1566		_	_	_	_	_	l _	١.
Zirconium + Indium		-	_	-	_	_	_	679		_	. !	_		_	_	١.
Zirconium + 1ron + EX;	2-11	_	_	_] _	_	_	1569		-	-	_	_	_	_	١.
Zirconium + Moiyedenum	1	-	- 1	_	-	.	681	_	683	_	_	_	_		۱.	Ì -
Zirconium + Niobium		_	_	_	۱ ـ	-	685	657	689	_	_	_	_	_	_	١.
·	2-1	-	_	_	_		_	691		_		_			_	١.
Zirconium + Tantalum + $\sum X_i$.		_	_	_	_	_	1570		_	_		_	_	_	_	_ ا
- 1	2- <u>I</u>	-	-	-	-	-	-	-	-	-	593- 695	-	~	-	-	-
Zirconium + Tin	2- <u>I</u>	657	-	-	-	-	699	702	70€	-	707	-	709- 714	~	-	-
Zirconium + Tin + ΣX_1	2-II	- 1	_	_	-	_	1572	-	- 1	-	; _	_	_	_	ĺ _	_
7irconium + Titanium	2-I	_	_	-	-	Ì _	-	715	-		1 -	_	_	_	۱ ـ	•
Zirconium + Uranium	2-1	717	-		-	_	719	721	723	i -	725	_	_		-	
Ziromium + Uranium + EX _i		-	-	-	-	-	-	1574	-	-	-	-	1576- 1578	-	<u> </u>	-
Zirconium alloys (special designations) 3Zi	2-∏	1558	-	-	-	-	1550	-	1562	1564		-	-	-	-	-
Zircaloys (see Zircaloy)				İ		}	}	}	1		Ì]		1	1	
Zirconium aluminides]]]				l
ZrAl ₂	6-1	-	39	-	-	-	-	-	-	-	41	-	-	-	-	-
•	6-1	-	39	-	-	-	-	-	j -	-	-	-	-	-	-	-
Zr ₂ Al ₃	6-1	-	39	-	-	-	-	-	-	1	-	-	-	-	-	1 -
Zr ₂ Al ₂	6-3	-	35	-	-	-	i -	-	Ī -	-	-	-	-	-	-	-
Zr ₂ Al ₄	6 4	j -	3,	-	-	-	-	-	-	-	j -	j -	-	-	-	.
Zirconium beryllides				l		1	į				ļ	j		l		1
•	6-1	-	148	-	-	-	-	-	-	į -	-	-	! -	į -	-	
ZrBe,	6-1	-	143	۱.	} _	١ -	_	۱ ـ	١.	1 _	1 _	1 _	1 _	1 _	1	١.

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Material Name	Volume	Density	Melting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Recistivity	Specific Heat	Thermal Conductivity	Thermal Diffusivity	Thermal Linear Expansion	Thermai Absorptance	Thermal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Pressure
Zirconium beryllides (cont.)		: 														
ZrBe ₃₃	6-1	_	148	-	_	-	_	156	152	_	154	_	_	156	_	
ZrBe _M	6-1	-	148	-	-	_	_	_	-	_	-	_	_	1.50	-] [
Zr ₂ Re ₁₁	6-1	-	_	_	_	_	_	_	_			_	_	156	-	l
Zirconium borides					İ							_			-	-
ZrB	6-1	-	-	-	-	-	-	-	281	-	_	_	_	-	-	۱.
ZrB ₂	6-1	274	274	-	274	+	277	279	-	-	283	-	266-	291	-	293
ZrB ₂₂	6- <u>1</u>	274	274	-	-	-	277	-	281	_	-	_	288	_	_	l _
Zirconium (di-)boride cermet .	6-11	842	-	-	-	-	844	846	848	-	850	_	_	_	۱.	
Zirconium (di-)boride + + Mohrbdenum (di-)boride	6-1	723	_	_	_	_	-		_							
Zirconium (di-)boride + + Molybdenum (di-)silicide	6-1		589							-		-	-	-	-	-
Zirconium (di-)boride +		-	003	-	-	-	-	-	-	-	691	-	-	-	-	-
+ Niobium (di-)boride Zirconium (di-)boride +	6-1	723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
† Tantalum (di-)buride	6-1	723	-	-	-	-	-]	- 1	-	-	- !	- 1	_	-	-	_
Zirconium carbide (ZrC)	5	263	263	-	-	-	265	267	269	271	273	-	277- 283	-	-	285
Zirconium (pyro-) carbide	5	-	-	-	_	-	-	-	-	_	273	_	_	_	_	_
Zirconium carbide + Graphite .	5	-	-	- !	-	-	-	-	-	-	825	-	_	_	_	
Zirconium-cobelt intermetallica (ZrCo ₂)	6-1		685	_	_	_	_	_		_		l				
Ziroonium ferride (ZrFo ₂)	6-1	- İ	366	_	_ İ	_	_ [_	_	_	<u> </u>	-	- j	-	•	-
Zirconium fluoride (ZrF.)	5	407	467	_	_	407	_	_	_	_	_ [-		-	-	-
Zirconium fluoride + Lithium fluoride	ō	_	413	_		_	_		_	_	_	_		-	•	-
Zirconium finoride + Rubidium	5		417	į		_				I			-	-	-	415
Zirconium fluoride + Sodium		İ	***	_	_	-	- 1	-	-	-	- 1	-	-	-	-	419
fluoride	5	-	421	-	-	-	-	- }	-	-	-	-	-	-	-	123
Zirconium germanides		ļ		l	1	- 1	ļ	1	- 1		- 1	1	- 1		l	
ZrGe	6-I	-	323	-	-	-	-	_	-	_	_	- İ	_	_	_	_
ZrGe ₂	6-1	-	323	-	-	-	-	-	-	-	-	-	- 1	_	_	_
ZrgGe	6-1	-	323	-	-	-	-	-	-	-	-	-	-	- 1	_ [- 1
ZrgGeg	6-I	-	323	-	-	-	-	-]	- 1	-	-	-	-	-	_	-
Zirconium hydride (ZrH ₂)	5	459	-	-	-	-	-	461	163	-	465	-	-	-	-	- [
Zirconium nitride (ZrN)	5	602	602	-	-	-	-	604	606	608	610	-	613- 615	-	-	617- 619
Zirconium (di-)oxide (ZrO2)	4-1	571	571	-	-	571	574	576	578	580	582- 587	-	589- 593	595	-	597
Zirconium (di-)oxide foam	4-1	-	-	-	-	-	-	-	_	_	557	_		_	_	
Zirconium (di-)oxide mix 148 .	4-1	- 1	-	-	-	_	-	-	316	- 1		_			_	
Zirconium (di-)oxide mix 187 .	4-1	-	-	- 1	-	- }	-	- 1	916	-	-	_	_		- 1	_ [
	_1		$oldsymbol{\bot}$										-			

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A 18. REPORTED TO THE PROPERTY OF THE PARTY

Material Name	Volume	Desaity	Malting Point	Heat of Fusion	Heat of Vaporization	Heat of Sublimation	Electrical Resistivity	Specific fleat	Thermal Conductivity	Thermal Diffuelvity	Thermal Linear Expansion	Thermal Absorptance	Thormal Emittance	Thermal Reflectance	Thormul Transmittance	Vapor Pressure
Zirconium (di-) oxide Norton mix 302	4-1	_	_	_	_	_	_			59G	_					
Zirconium (di-)oxide ZP-58	5	_	: 	-	_	_	_	799				_	_			
Zirconium (di-)oxide ZP-71	5	_	_	_	١.	_		799				_	_		_	-
Zirconium (di-)oxide coating on Inconel	6-11	-	_	_	-	_	_	_	_	-	_	_	_	1397		
Zirconium (di-) oxide costing on Inconel X	6-11	-	-	_	-	_	_	-	_	-	-	-	1399	1401	-	-
Zircenium (di-) oxide + ΣX_i	5	-	-			_	_	799	_	_	_	_			_	_
Zirconium (di-) oxide + Aluminum oxide	4-1	-	_	-	-	-	-	-	-	906	908	-	-	-	-	-
Zirconium (di-) axide + + Beryllium oxide + Aluminum oxide	4-1	_			1											
Zirconium (di-)oxide + Calcium oxide	4-1	_	`		-	-	912	914	916	- 918	910 920	-	-	-	-	-
Zirconium (di-)oxide + Calcium oxide + Cerium (di-)oxide	4-1	_	_	_	_	_		-	925	310	320	-	923	-	-	-
Zirconium (di-)oxide + Calcium	4-3	_	_	_	_	_	_	_	-	_	927	_	-	-	-	-
Zirconium (di-)oxide + Cerium (di-)oxide	4-1	_	_	_	_	_	-	-	_	929	531		_	_	_	_
Zirconium (di-) exide + + Dysprosium exide	4-1	-	_	_	_	_	_	_	-	_	934	_	_		_	_
Zirconium (di-) oxide + Hafnium + + Magnesium	5	-	-	-	-	-	_	797	-	_	-	_	-	-	-	-
Zirconium (di-)oxide + Hafnium (di-)oxide	4-1	-	936	-	-	-	-	-	-	-	_	_	_	-	-	-
Zirconium (di-)oxide :	4-1	-	-	-	-	-	936	-	940	942	944	_	-	-	-	-
Zirconiam (di-)oxide + + Magnesium oxide + Beryllium əxide	4-1	_	947	_	-	_	-	_	_				_		_	
Zirconium (di-)oxide Niobium (pent-)oxide	4-I	-	949	-	-	-	-	-	-	-	951	_	_	-	-	_
Zirconium (di-)oxide + + Phosphorus (pest-)oxide	4- <u>i</u>	-	-	-	-	-	_	-	_	_	953	_	_	_	_	_
Zirconium (di-)oxide + Silicon (di-)oxide	4-i	-	-	-	-	-	_	_	-	_	955	_	_	_	_	-
Zircenium (di-)oxide + Thorium (di-)oxide	4-i	-	-	-	-	-	-	-	_	_ [955	-	-	-	_	-
Zirconium (di-)oxide + Titaniam cermet	6-11	-	-	-	-	-	_	826	825	830	532	_]	-	_	-	_
Zirconium (di-)odde - Tranium (di-)oxide	4-1	-	-	-	-	-	-	-	_	-	960	_	-	-	-	_
Zirconium (di-)oride + Uranium (di-)oxide	4- <u>1</u>	962	964	-	-	-	_	-	-	_	966	-	-	-	_	_
Zirconium (di-)oxide + Yttrium oxide	4-1	-	-	-	_	-	_	_	968	_	970	_	_	_	_	_
Zireznium (di-)oxide + Yttrium oxide / Cerium (di-)oride	4-1	-	-	-	-	-	-	-	972	-	-	-	-	-	-	-
						ı				- 1	ı				ı	

CANAL CONTROL OF THE PROPERTY

Material Name	Volume	Deabily	Melting Point	lient of Fusion	Heat of Vajorization	Heat of Sublimation	Electrical Resistivity	Specific Heat	Thermal Conductivity	Therma! Diffusivity	Thermal Linear	Thormal Absorptance	Thormal Emittance	Thermal Reflectance	Thermal Transmittance	Vapor Presure
Zirconium (di-)oxide + Ytirium oxide + Zirconium cermet	6-11	,	-	-	-	-	-	-	334	-	-	į	-	-	-	-
l'irronium (di-)oxide + + Zirconium cermet	6-11	-	-	`	-	-	-	-	-	836	838	-	-	-	-	840
Zirconium (di-)oxide ZT-15-M cermet Zirconium phoephates	6-II	-	-	-	-	-	-	926	-	830	-	-	-	-	-	-
1																
Z*O ₂ · P ₂ O ₃	3-11 4-11	-	-	-		-	-	-	-	-	1185	-	-	-	-	-
Zirconium (ortho-)silicate (ZrO ₂ ·SiO ₂)		1344	13(1	-	-	-	1346	1348	1350	-	1352	-	-	-	-	-
Zirconium (ortho-)silicate + + Beryllium aluminum		4.577	2.0 7, 7	-	-	-	2.000	1010	2.500	-		-	-	-	-	-
silicate Zirconiura silicides	4-11	-	-	-	-	-	-	-	-	-	1577	-	-	-	-	-
Zr3i	6-1	517	_	_	_	_			_	-		_		_	_	_
ZrSi ₂	6-1	517	517	_	_	_	_	_	_ '	_	519	_		521	_	
ZrSi	6-1	517	_	-		_	_	_	_ ;		_	_		-		
Zr ₂ Si ₂	6-1	5:7	. 1		_	_	_	_	_	_	_	_	_	_	_	
Zr _s si	6-1	517	_	_	_	_	_	_	_	_		_	_			
Zr _s Si ₂	6-1	517	-	_	-	-	-	_	-	-	-	-	-	_	_ '	- 1
Zr _g Si _g	6-1	517	-	_	_	_	-	_	_	_	_	-		-	_ '	. 1
Zr _s Si _e	6-1	517	-	_	-	-	-	-	-	-	-	-	-	-	-	_
Zirconium tantalum carbide (Ta _X Zr _y C ₂)	5	-	-	-	-	-	-	-	-	-	257	-	290	_	-	-
Zirconium titanate (ZrO2 - TiO2).	4-11	-	-	-	-	-	-	-	-	-	1470	-	-	-	-	- 1
Zirconium uranium carbide (Zr _x U _{1-x} C)	5	-	-	-	-	-	292		-	-	-	-	-	-	-	-
Zirconium-vanadium inter- metallics (ZrV ₂)	6-1	-	585	-	-	-	-	-	-	-	-	-	_	_	-	-
Zirox, grade A	4-1	-	- 1	-	-	-	-	-	-	-	582	-	-	i -	-	_
ZT-15-M zirconium (di-)oxide cermet	6-II	-	-	-	-	-	-	626	-	830	-	-	-	-	-	-